Review of the International Clinical, Operational, and Health Services Research and Training Award (ICOHRTA)

Final Report

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Executive Summary

The International Clinical, Operational, and Health Services Research and Training Award (ICOHRTA) Program supports collaborative research and training intended to build sustainable research capacity in clinical, operational, health services and prevention science research related to non-communicable diseases and disorders at institutions in low- and middle-income countries. An RFA for the ICOHRTA program was released in 2001. Using the D43 International Training Grant mechanism, the program was open to US institutions wanting to collaborate with research institutions in eligible low or middle income countries. A smaller Developmental ICOHRTA was available to establish new collaborations. The 2001 RFA described a variety of training-related purposes for which award funds could be used, including salaries and stipends for faculty at the grantee and partner institutions; tuition, fees, living expenses, and stipends for trainees; travel; and trainee research projects. Eligible research and training topics were required to be relevant to the public health priorities of the low or middle income country and of interest to at least one of the five co-funding program partners (National Institution of Mental Health, National Institute on Drug Abuse, National Center for Complimentary and Alternative Medicine, National Institute on Aging, and National Institute on Dental and Craniofacial Research). The ICOHRTA RFA was re-issued in 2006 with minor changes including a change in the parent grant requirement, reduction in the available funding and a different set of program partners.

This report describes the findings of a review of the first five years of the ICOHRTA program. The purpose of the review was to analyze program implementation, identify near-term outputs, and make recommendations for future improvements to the program. The review was conducted by a panel of three extramural investigators with a diverse set of backgrounds and no formal links to the program or awarded investigators. During a series of three teleconferences held between October 2007 and July 2008, panel members reviewed evidence compiled from sources such as investigator progress reports, NIH databases, and interviews with stakeholders.

Overall, the panel concluded that the program was successful and productive in its first five years. Notable accomplishments include the following:

- Nine of the eleven ICOHRTA awards made in 2001 were competitively renewed in 2006, and two of the three recipients of Developmental ICOHRTA awards competed successfully for new regular ICOHRTA awards.
- A total of 129 trainees from 18 low- and middle-income countries in five world regions have been associated with the program for at least six months, and many more individuals have participated in shorter-term training activities.
- Five former ICOHRTA trainees have competed successfully for NIH R01 awards, and one additional trainee is PI on a Cooperative Agreement with the Centers for Disease Control and Prevention. Former trainees also collaborate on at least three NIH awards made to US PIs since 2001, including an FIC Trauma award and a FIRCA award.
- At least 147 research projects have been supported through ICOHRTA, including

41 projects classified as implementation research or pre-implementation research.

- A total of 381 peer-reviewed journal articles are known to have been associated with ICOHRTA awards, as are an additional 47 non-peer reviewed publications such as book chapters, books, and policy documents.
- ICOHRTA played a key role in several important national public health and policy projects. Examples include contributions to an evidence-based National Mental Health Policy for Turkey, an ongoing National Diabetes Survey in India, a course in STD bioethics that is now used by all medical schools in Porto Alegre, Brazil, and Vietnam's current efforts to establish its first licensing standards for psychiatric professionals.
- ICOHRTA personnel and resources helped to establish at least four new national professional societies: a Polish Society for Addiction Research, a Peruvian Addiction Medicine Society, a Non-Communicable Disease Network in India, and a professional organization for child psychologists in Turkey.
- ICOHRTA played a role in helping institutions to establish new curricula, research facilities and degree-granting programs. Examples include a new drug research unit at the Universidad Peruana Cayetano Heredia in Peru, a new community medicine/epidemiology program at a regional university in India, Vietnam's first doctoral program in psychiatry, and Poland's first bioinformatics program.
- ICOHRTA built infrastructure for disaster response efforts, especially in the area of mental health. At least four long term trainees from two different ICOHRTAs are known to have been involved in the response to the devastating 2008 earthquake in Chengdu, China.

While the program was judged to have been unusually productive, the panel made several recommendations for the future of the program. Key recommendations include:

Explore options to broaden the range of eligible non-communicable disease and disorder topics to better reflect the non-communicable disease priorities of low and middle income countries. (Recommendation 1)

The range of disease foci during the first five years was relatively narrow; twelve of the fourteen ICOHRTA awards focused on some combination of substance abuse, mental health and/or behavioral interventions for HIV/AIDS and STDs. Although the formal

requirement that all topics must be of interest to at least one program partner was removed in 2006, panel members are concerned that the need for co-funding may discourage potential applicants from addressing certain non-communicable disease and disorder priorities. Solutions proposed by the panel include recruiting new IC partners as well as setting aside FIC funds to support a limited number of projects that address the disease priorities of the developing country partners but are not of interest to participating partner ICs. If the latter option is implemented, this change should be advertised in the solicitation so that potential applicants with research interests that do not align with program partners are not discouraged from submitting proposals.

Consider issuing the next ICOHRTA solicitation as a Program Announcement instead of a Request for Applications. (Recommendation 2)

Since applications are accepted only once per RFA, applicants only get one chance to succeed. In contrast, PA-based programs that accept applications as they come in allow the most determined applicants to revise their proposals based on feedback from reviewers. An additional consequence of running ICOHRTA as an RFA-based program is that program partners are required to commit funds up front; with a PA, potential program partners can express interest and decide whether to participate after seeing the applications. If the program were to switch to a PA, it might be possible to attract more partner ICs, thus broadening the range of topics for which co-funding would potentially be available and perhaps increasing the likelihood that partner ICs would see proposals of interest. The only significant downside would be that funds would not be committed up front and would instead have to be allocated when meritorious proposals were identified.

Future program planning should acknowledge the need for flexibility on the part of individual PIs in order to meet the diverse capacity-building needs of their partner institutions and countries. (Recommendation 3)

Because it aims to meet a wide variety of capacity-building needs of the partner institution and country, the ICOHRTA program should allow the PIs as much flexibility as possible to develop and implement innovative training strategies. The extra emphasis on adjusting to the needs of the partner institutions in the 2006 RFA was a positive development, and this trend should continue in future iterations of the program.

Revise the parent grant requirement to establish a minimum threshold for existing research funding from all sources shared among the PI and co-PIs to ensure an adequate research platform for the proposed training program. (Recommendation 4)

While the panel agrees that a base of funded research at the US institution is essential, it is not necessary that this support come from NIH, nor is it necessary that the ICOHRTA PI be named as the PI or Project Director on another grant. Instead, the experience and funded research base of the entire team of participating US faculty members should be taken into account.

Adjust the language used in the ICOHRTA solicitation regarding implementation research to be as consistent as possible with the language and definitions used in the FIC Strategic Plan, other NIH programs, and across the Federal science agencies. (Recommendation 5)

Program staff confirmed that the ICOHRTA program was intended to overlap with the area of inquiry referred to as 'implementation research' in the most recent FIC strategic plan; the term 'implementation research' should therefore appear prominently in future solicitations. As a first step, the term 'operational' should be replaced with 'implementation' in both the program title and the solicitation. Furthermore, FIC should ensure that its use of 'implementation research' is fully consistent with usage in other solicitations at NIH and beyond.

In future rounds of review, ensure that at least one pre-review meeting is held to orient reviewers to the unique aspects of the D43 mechanism as well as the ICOHRTA program objectives and review criteria. (Recommendation 6)

During the 2001 review, a conference call with the Program Officer and Scientific Review Administrator had been held at the beginning of the review process in order to ensure that the study section members understood the program and the review criteria. This did not occur in the 2006 round, and the process may have suffered as a result.

Re-introduce the Developmental ICOHRTA awards and broaden their scope to include establishment of basic research infrastructure (e.g. IRBs, lab and computing facilities, trained support personnel) at the foreign institution. (Recommendation 7)

Evidence indicates that the Developmental ICOHRTA awards made in 2001 succeeded in establishing successful collaborations. There was also at least one regular ICOHRTA award that likely would have benefited from a preliminary award in order to establish infrastructure such as an IRB at the collaborating institution.

FIC should strengthen its efforts to nurture relationships with partner ICs in order to keep them engaged. (Recommendation 8)

While the panel recognizes that declining participation on the part of several important partner institutions, most notably NIMH, is likely due to factors beyond FIC's control,

efforts to maintain and expand partnerships should be intensified. In particular, program staff from the partner ICs should be encouraged to play a larger role in the annual Network Meetings in order to keep them engaged.

Increase the frequency of the Network Meetings and explore options for lower cost alternatives to facilitate communication and networking across the ICOHRTAs between meetings. (Recommendation 9)

The Network Meetings were praised by both PIs and trainees as an important forum for sharing ideas, discussing common problems, and networking. Both groups felt they should occur more frequently, perhaps every year or every other year, and that FIC should facilitate additional opportunities for networking and communication if possible. There are a number of user-friendly, customizable, off-the-shelf commercial options available for free or for a nominal fee that might enhance communication among ICOHRTAs. FIC should also explore whether, with additional coordination, webcasting technologies and other tools developed for individual ICOHRTAs through a NIMH SBIR solicitation might be used to improve communication across the ICOHRTA network. The best way to accomplish such coordination is unclear; perhaps a small and informal working group including members from the ICOHRTAs with the most experience using these technologies could be established to make preliminary recommendations. A coordinating center for the ICOHRTAs or for all D43 programs is another option, but the cost might be prohibitive.

The variety and flexibility of training strategies is a strength of the ICOHRTA program, and the current trend toward more training activities taking place in the partner country should be encouraged. (Recommendation 10)

Virtually every ICOHRTA reported pursuing a variety of training strategies, resulting in a broad range of training models. Strategies described by various PIs included:

- Graduate degree and postdoctoral training at US institutions;
- Re-entry research grants for research upon return to the home country;
- US-based training or research experiences for more senior investigators;
- Lectures, symposia, and other short-term training in the collaborating country;
- Mentored research support in the collaborating country;
- Intensive workshops for faculty and/or professionals at the partner institution;
- Curriculum development, co-teaching, and informal support for faculty at the partner institution;
- Support for students pursuing degrees at partner institutions.

The broad variety of training strategies is appropriate, and the program should continue to allow PIs and collaborators the flexibility to match training models with the needs of the collaborating institution. Flexibility to conduct training activities outside the US is a particularly important feature of the program, both because it makes economic and logistical sense and because it can have capacity-building "ripple effects" that don't occur if trainees are brought to the US. Strategies such as curriculum development and co-teaching that contribute to long-term, sustainable research capacity building are also critical, although their concrete outputs can be difficult to quantify.

Require each partner institution to make an appropriate up-front commitment of time, funds, and/or other resources in order to ensure buy-in. (Recommendation 11)

PIs used a variety of effective strategies to stretch scarce funds as far as possible, including web-based conferencing and economy travel. The strategy of encouraging partner institutions to share costs of a limited basis was also employed especially, particularly by several ICOHRTAs in China. This strategy has the added benefit of ensuring buy-in on the part of the collaborating country or institution. However, if implemented as a requirement for all ICOHRTAs, steps be taken to ensure it does not discourage participation on the part of the institutions and regions most in need of capacity building. It should therefore be implemented in a flexible manner that would allow FIC to adjust requirements to reflect the resource constraints of particular institutions and to waive the requirement entirely when justified by the circumstances.

Allow facilities and administration (F&A) costs for the partner institution to be budgeted as direct costs. (Recommendation 12)

The D43 mechanism limits facilities and administration (F&A) costs to eight percent of direct costs for both the main award and sub-awards. The US institution does not typically share its eight percent, leaving the foreign institution with only eight percent of the sub-award. The panel views this as problematic because covering F&A costs is essential for building research capacity. While it would be desirable to change US university policies to allow for more equitable sharing of F&A funds, this option was viewed as impractical and too difficult to enforce. Instead, FIC should change its own policy to ensure that adequate funds to cover F&A costs are transferred to the collaborating institution.

Require each ICOHRTA to set milestones for itself, and monitor progress relative to the milestones at regular intervals. (Recommendation 13)

As the ICOHRTA awards demonstrate, the range of activities that can meaningfully be described as 'training' is very broad, with different kinds of training activities aiming to build different kinds of research capacity at a variety of levels (e.g. individual, institutional, national, regional). The ICOHRTA solicitation's lack of specificity with respect to capacity-building objectives at the program level appears to have allowed PIs the flexibility to address the equally broad range of capacity-building needs at the collaborating institutions. Somewhat paradoxically, however, this vagueness at the level of program goals made it difficult to determine whether the program had succeeded in meeting its own goals. Because capacity-building success is best judged in context, the panel recommends that specific capacity-building goals should be established for each ICOHRTA at the award level.

Develop a set of outcome indicators against which future success of the ICOHRTA program as a whole will be measured, and re-assess those indicators regularly using information from annual reports and future program evaluation efforts. (Recommendation 14)

Finally, the panel believes it would also be beneficial to develop a set of indicators at a program level to facilitate monitoring and evaluation. These indicators should be designed specifically to measure progress relative to desired program-level outcomes.

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Introduction

The John E. Fogarty International Center (FIC) at the National Institutes of Health (NIH) supports international collaborative research and training programs that advance the NIH mission through international partnership. FIC routinely conducts process reviews for each of its extramural award programs after the first five years. The purpose of these process reviews is to analyze program implementation, identify near-term outputs, and make recommendations for future improvements to the program. If the program reaches the ten year mark, the process review is followed by a more extensive evaluation effort to fully document program outcomes and lessons learned.

The International Clinical, Operational, and Health Services Research and Training Award (ICOHRTA) Program is currently undergoing a process review. Established in 2001, ICOHRTA supports collaborative research and training intended to build sustainable research capacity in clinical, operational, health services and prevention science research related to non-communicable diseases and disorders at institutions in low- and middle-income countries. A total of 14 ICOHRTA awards were made to US institutions with partners in low- and middle-income countries during the first five years of the program. The ICOHRTA Request for Applications (RFA) was re-issued in 2006, but the process review focused exclusively on the awards made during the first five years.

This report describes the results of the ICOHRTA process review. After a brief description of review methodology, a description of the program history and basic statistics is provided as background. Review findings and recommendations are then detailed in four sections that correspond to the criteria for assessment from the FIC Framework for Program Assessment[1]: Program Planning, Program Management, Partnerships and Communication, and Results. Appendices include biographical information on the review panelists as well as additional documents to support the analyses presented in this report.

Methods

The ICOHRTA process review was conducted by a panel of three extramural investigators with a diverse set of backgrounds and no formal links to the program or awarded investigators. Please see Appendix A for biographical information on the review panel members. Panel members participated in a preliminary teleconference on October 24, 2007 in order to approve the proposed logic model (Appendix B), evaluation study questions (Appendix C), and data collection strategy. Program data were then collected and summarized by the Science and Technology Policy Institute (STPI), a contractor selected by FIC to support the evaluation. Panel members met on April 18, 2008, again via teleconference, to review the summarized program data and to make preliminary recommendations about the program. Findings and recommendations were then reviewed by the panel members and other stakeholders during the early summer of 2008.

1 Available online at http://www.fic.nih.gov/about/plan/eval_framework.htm, accessed May 6, 2008.

A final teleconference was held on July 22, 2008 in order to finalize the recommendations.

Data collection for the review of the ICOHRTA program included the following:

- *Review of Program Documentation.* The review of program documents included the 2001 and 2006 Requests for Applications, original and renewal applications for funded grants, investigator progress reports, and documentation from network meetings. Data on publications, trainees, supported research projects, and collaborators were extracted to structured data sets in order to facilitate analysis.
- *Environmental Scan.* FIC Strategic Plans were reviewed along with associated documents, including a Needs Assessment conducted in 2006 to assist in Fogarty's strategic planning process. Where necessary, information from the 2006 Needs Assessment was updated for the ICOHRTA review. This included an updated scan of publicly available information on funding organizations with programs similar to ICOHRTA.
- *Extraction of Information from NIH Databases.* Information extracted from NIH databases includes funding and co-funding information for the ICOHRTA awards, additional NIH awards made to ICOHRTA PIs and trainees, publications citing the ICOHRTA award. The identity of the grant reviewers was also extracted from NIH databases, and their biographical details were supplemented by internet searches.
- *Interviews with ICOHRTA PIs.* In-person or telephone interviews were conducted with a total of eight ICOHRTA Principal Investigators (PIs) who responded to a call for volunteers.[2] All of the PIs, including those who did not participate in interviews, were given the opportunity to review and comment upon summarized evaluation findings. Interview discussion guides are included as Appendix D.

- *Interviews with ICOHRTA Trainees.* Telephone interviews were also conducted with a total of seven ICOHRTA trainees, and two additional trainees provided answers to the same set of questions via email. Trainees were selected for interview based on recommendations from PIs, who were asked to identify trainees who they believed would represent the broadest possible range of experiences. Trainees interviewed represented seven of the ICOHRTA programs

[2] In one case the PI requested that we interview the major foreign collaborator instead. Since the ICOHRTA in question operates almost exclusively at the foreign site, the information provided by the foreign collaborator was treated as equivalent to the information provided by the actual PIs at other ICOHRTAs.

and six home countries. Interview discussion guides are included as Appendix D.

- *Other Interviews.* Supplementary interviews were conducted with the FIC Program Officer responsible for the ICOHRTA program, the study section chair for both rounds of ICOHRTA review, and representatives from partner institutes NIDA and NIMH. Interview discussion guides are included as Appendix D.

Background

Program Origin and History

According to FIC program staff, the ICOHRTA concept was originally developed in response to a perceived gap in support for international training in clinical and health services research, including operations and prevention research. FIC convened a consultation in 2000 to get input from potential program partners on this new concept. NIH Institutes and Centers (ICs) participating in this consultation included: National Institute for Mental Health (NIMH), National Institute on Drug Abuse (NIDA), National Center for Complimentary and Alternative Medicine (NCCAM), and National Institute for Child Health and Human Development (NICHD). NIMH, NIDA, and NCCAM subsequently joined as program partners during the first five years. The National Institute on Aging (NIA) and National Institute for Dental and Craniofacial Research (NIDCR) also became program partners.

An RFA for the ICOHRTA program was released in 2001. Using the D43 International Training Grant mechanism, the program was established with a budget of $3 million. Regular ICOHRTA grants, intended to support relationships between US institutions and institutions in an eligible country, were capped at $250,000 per year in direct costs for a maximum of five years. Smaller developmental awards ($100,000 per year over three years) were also available in order to develop a new collaboration. Eligible PIs were required to be affiliated with a US institution and to specify a single Major Foreign Collaborator (MFC) at a research institution in an eligible low or middle income country. Applicants were also required to already be a program or project director on an active NIH curriculum development, training, or centers award (referred to as the "parent grant").[3]

The 2001 RFA described a variety of training-related purposes for which award funds could be used, including salaries and stipends for faculty at the grantee and partner institutions; tuition, fees, living expenses, and stipends for trainees; travel; and trainee research projects. More than half of the funds were required to be spent at the foreign site, with greater emphasis shifting to the foreign site as research capacity increased.

The 2001 RFA did not require that proposals focus on any specific disease area, but research topics were supposed to be relevant to the public health priorities of the low or middle income country in which the MFC was located and of interest to at least one of

[3] Other D43 awards were not eligible as parent grants. The parent grant was also required to have at least 15 months of funding remaining (12 months for developmental ICOHRTAs).

the co-funding program partners (NIMH, NIDA, NCCAM, NIA, and NIDCR). Most infectious disease topics were therefore excluded due to lack of interest from appropriate co-funders, but NIMH did express specific interest in proposals focused on HIV/AIDS in connection with mental health issues.

Although not formally a part of this review, for the purpose of understanding context it is important to note that the ICOHRTA RFA was re-issued in 2006. Stated program goals did not change substantively, but a subtle shift in language suggested a new emphasis on encouraging a variety of training methods to best meet the capacity-building needs of the MFC institutions. Additional changes with potential significance included the following:

- The National Institute for Neurological Disorders and Stroke (NINDS) and Office of Dietary Supplements in the Office of the Director (OD/ODS) joined as program partners while one of the original partners (NCCAM) dropped out.
- HIV/AIDS topics became ineligible, shifting the program to an exclusive focus on non-communicable diseases and disorders.[4]
- Proposed topics were no longer explicitly required to be of interest to a program partner, but areas of particular interest to partner ICs were described in detail, suggesting that a proposal in one of those target areas would stand a better chance of being funded.
- Total funds available decreased by $500,000 to $2.5 million per year, and allowable annual maximums decreased to $200,000 for competitive renewals and $150,000 for new applications.
- Developmental ICOHRTA awards were eliminated.
- Eligibility requirements for MFC countries were changed to mirror the World Bank low- and middle-income classifications, and institutions in the Hong Kong Special Administrative Region (SAR) were excluded except when partnering with a mainland Chinese institution.
- The parent grant requirement was modified to include active research awards instead of training awards, and it could be satisfied by any faculty member involved in the project (as opposed to the PI only).[5]
- The number of allowable MFCs per award was increased from one to two.

Descriptive Information on 2001 ICOHRTA Cohort

A total of eleven regular and three developmental ICOHRTA awards were made in 2001. Of the eleven original regular awards, nine were renewed in 2006, and two of the developmental awards were converted to new regular ICOHRTA awards. Three additional new ICOHRTA awards were also added in 2006.

Including Supplements, total cost for the ICOHRTA program during the first five years was $15,218,520. Without Supplements, it was $14,502,949. The average 5-year total

4 A separate Fogarty training program, referred to as ICOHRTA-AIDS/TB, was launched in 2002 to focus on clinical, operational, and health services research related to HIV/AIDS and tuberculosis (see PA-02-022; RFA-TW-04-002). Although the two programs share a similar name and scientific focus, they are administered separately and rely on different mechanisms (ICOHRTA-AIDS/TB is a two phase program, beginning with an R21 Planning Grant and then allowing recipients to compete for U2R International Cooperative Agreements that provide funding directly to both the US and foreign institutions). ICOHRTA-AIDS/TB shares a number of awardees with the larger AIDS International Research and Training Program (AITRP).

5 This change brought the parent grant requirement into alignment with other D43 programs.

cost per regular award (including Supplements) was $1,247,474 and per developmental award was $498,766. ICOHRTA awards went to 13 US institutions located in Alabama, California, Connecticut, Massachusetts, Michigan, Missouri, New York, and Tennessee (Table 1).

Table 1: Major Foreign Collaborators (MFCs) and Other Collaborators on ICOHRTA awards.

US Institution	MFC Institution	MFC Country	Other Foreign Collaborators
UCLA	Hanoi Medical University	**Vietnam**	National Institute of Hygiene and Epidemiology, **Vietnam**; Quang Ninh Provincial Center for Preventive Medicine, **Vietnam**; Hanoi School of Public Health, **Vietnam**
UCSF	Centra de Estudos de AIDS do Rio Grande do Sul	**Brazil**	University Federal do Bahia, **Brazil**
Vanderbilt University	National Institute of Pediatrics	**Vietnam**	Vietnam National Hospital, **Vietnam**; Danang Psychiatric Hospital, **Vietnam**; Center for Applied Psychology, **Vietnam**; Children's Hospital #2 Ho Chi Minh City, **Vietnam**
Children's Hospital, Boston	Ankara University	**Turkey**	Hacettepe University, **Turkey**
Yale University	University of Pretoria	**South Africa**	(none)
Harvard Medical School	Chinese University of Hong Kong	**Hong Kong S.A.R.**	Peking University Institute of Mental Health, **China**; Shanghai Mental Health Center, **China**
UC Berkeley	Charles University	**Czech Republic**	(none)
Washington University	National Institute of Mental Health and Neuro Sciences	**India**	Indian Statistical Institute, **India**
University of Rochester	Chinese University of Hong Kong	**Hong Kong S.A.R.**	Sichuan University, **China**; Hong Kong University, **Hong Kong S.A.R.**
University of Alabama-Birmingham	Vinnitsa State (Pirogov) Medical University	**Ukraine**	Kyiv-Mohyla Academy of Public Health, **Ukraine**; St. Petersburg State University, **Russian Federation**
University of Alabama-Birmingham	Madras Diabetes Research Foundation	**India**	(none)
Stanford University	China National Health Economics Institute	**China**	(none)
University of Michigan	Institute of Psychiatry and Neurology	**Poland**	Medical University of Warsaw, **Poland**; Pomeranian Medical University, **Poland**; Institute on Drug Dependencies Centrum, **Slovak Republic**; Riga Stradins University, **Latvia**; Institute of Neurology, Psychiatry & Narcology of Academy of Medical Sciences of Ukraine, **Ukraine**
Michigan State	Universidad Peruana Cayetano Heredia	**Peru**	(none)

Collaborators included 35 foreign institutions from 13 countries plus the Hong Kong SAR: Brazil, China, Czech Republic, India, Latvia, Peru, Poland, Russian Federation, Slovak Republic, South Africa, Turkey, Ukraine, and Vietnam (Figure 1, Table 1).

Figure 1: Location of ICOHRTA Major Foreign Collaborators

Twelve ICOHRTA awards focused on some combination of substance abuse, mental health and/or behavioral interventions for HIV/AIDS and STDs. The other two awards focused on aging-related issues and cardiovascular disease and diabetes (Table 2).

Table 2: Number of ICOHRTA awards by region and disease focus.

Disease Focus	Total Number of Awards	Region
Adult Mental Health	4	East Asia & Pacific (2); Europe & Central Asia (1); South Asia (1)
Aging-related Health Services	1	East Asia & Pacific (1)
Cardiovascular Disease and Diabetes	1	South Asia (1)
Child Mental Health and/or Developmental Disabilities	2	East Asia & Pacific (1); Europe & Central Asia (1)
HIV/AIDS	2	Latin America & Caribbean (1); Sub-Saharan Africa (1)
STDs and Substance Abuse	2	East Asia & Pacific (1); Europe & Central Asia (1)
Substance Abuse	2	Europe & Central Asia (1); Latin America & Caribbean (1)

Program Planning

Key Program Design Issues

The ICOHRTA Program has succeeded in leveraging funding from partner ICs (see Figure 1 under Partnerships and Communication). However, the tradeoff has been a narrowing of funded research topics to only those of interest to program partners. Specifically, the fact that several of the key institutes and centers with an interest in non-communicable diseases and disorders (e.g. the National Cancer Institute, National Heart, Lung, and Blood Institute, and National Institute of Diabetes and Digestive and Kidney Disease) do not participate means that not all of the non-communicable disease and disorder priorities of low and middle income countries can be effectively addressed through this program.[6]

Although the panel recognizes a need to leverage funding from other sources, members are concerned about the potential for projects that match the disease interests of the co-funding institutes and centers to take priority over projects that best address the needs of the partner country. FIC should explore options to broaden the range of eligible topics.

> **Recommendation 1: Explore options to broaden the range of eligible non-communicable disease and disorder topics to better reflect the non-communicable disease priorities of low and middle income countries.**

Options to consider include recruiting new IC partners as well as setting aside FIC funds to support a limited number of projects that address the disease priorities of the developing country partners but are not of interest to participating partner ICs. If the latter option is implemented, this change should be advertised in the solicitation so that potential applicants with broader research interests are not discouraged from submitting proposals.

A second design issue of interest is that the ICOHRTA solicitation is a one-time RFA rather than a three-year Program Announcement (PA). Since applications are accepted only once per RFA, applicants only get one chance to succeed. In contrast, PA-based programs that accept applications as they come in allow the most determined applicants to revise their proposals based on feedback from reviewers. Several interviewees noted that determined applicants are most likely to commit fully to the proposed collaboration. An additional consequence of running ICOHRTA as an RFA-based program is that program partners are required to commit funds up front; with a PA, potential program partners can express interest and decide whether to participate after seeing the applications. If the program were to switch to a PA, it might be possible to attract more partner ICs, thus broadening the range of potential applicants and perhaps increasing the likelihood that partner ICs would see proposals of interest.

[6] It should be noted, however, that one Developmental award with a focus on diabetes and cardiovascular disease was awarded without co-funding in 2001 and converted to a regular ICOHRTA in 2006.

Recommendation 2: Consider issuing the next ICOHRTA solicitation as a Program Announcement instead of a Request for Applications.

A third key design issue is the importance of flexibility to the ICOHRTA program. Because it aims to meet a wide variety of capacity-building needs of the partner institution and country, the ICOHRTA program should allow the PIs as much flexibility as possible to develop and implement innovative training strategies. The extra emphasis on adjusting to the needs of the partner institutions in the 2006 RFA was a positive development, and this trend should continue in future iterations of the program.

Recommendation 3: Future program planning should acknowledge the need for flexibility on the part of individual PIs in order to meet the diverse capacity-building needs of their partner institutions and countries.

Specific aspects of flexibility that would be desirable include the following:

- Flexibility to adapt the training model to the needs of the country, particularly with respect to location and duration of training;
- Flexibility to expand the number of collaborating institutions to include a regional catchment area when appropriate to the discipline and research topic;
- Flexibility in use of funds, particularly the ability to advance funding to foreign collaborators and to pre-convert funds as a way to minimize losses due to the falling value of the dollar.[7]

Poland: Society for Addition Medicine

Illicit and non-prescription drug use, abuse, and dependence are believed to be highly prevalent in Poland and other Eastern European countries, many of which are struggling to cope with socioeconomic disadvantages and limited funding for healthcare research. Few of the evidence-based interventions to prevent and treat substance use disorders have been implemented and studied regionally, leaving these countries vulnerable. To raise of these problems and begin addressing them, the University of Michigan ICOHRTA worked with senior officials at the Polish Ministry of Health to establish a new national professional organization focused on addition research. Modeled on the US-based College of Problems on Drug Dependence and Research Society on Alcoholism, the multi-disciplinary research society was chartered in order to provide ongoing consultation and advice to the Polish government on addiction research. The society now includes over 100 members, including many current and former ICOHRTA trainees, and it has been actively working to make substance abuse problems more visible to Polish government leaders and parliament members.

A final design issue considered by the panel was whether the parent grant requirement should be retained. FIC program staff members explained that the purpose of the original parent grant requirement (that the PI must have a curriculum development, training, or Centers award) was to demonstrate the PI's ability to effectively manage a training program. An additional potential benefit was to increase the likelihood that there would be opportunities to leverage existing resources (such as a T32 institutional training program) for the benefit of ICOHRTA trainees. Panel

[7] Please note, however, that such decisions are not always under the control of FIC or the ICOHRTA PIs; FIC encourages the university business offices to cooperate with requests from the PIs but has little recourse if their policies are inflexible.

members are concerned, however, that this requirement might discourage otherwise qualified investigators from submitting applications. For instance, one individual who is currently the PI on a very successful ICOHRTA award originally applied as a co-PI because he did not meet the eligibility requirements in 2001.

The 2006 parent grant requirement was less restrictive; it stated that the PI must have another NIH research or training award. FIC staff reported that the purpose of this requirement, common to most D43 programs, is to ensure that there is a platform of supported research on which to build the training program. The panel agrees with the logic that a platform of supported research at the US institution is desirable, but it is not necessary that this support come from NIH, nor is it necessary that the ICOHRTA PI be named as the PI or Project Director on another grant. Instead, the experience and funded research base of the entire team of participating US faculty members should be taken into account.

> **Recommendation 4: Revise the parent grant requirement to establish a minimum threshold for existing research funding from all sources shared among the PI and co-PIs to ensure an adequate research platform for the proposed training program.**

Implementing this recommendation would ensure an adequate base of funded research and increase opportunities for synergy while simultaneously expanding the pool of eligible PIs to include individuals who might have less management experience but more enthusiasm and available time.

Strategic Role for ICOHRTA at FIC

When the ICOHRTA concept was launched in 2001, FIC strategic goals focused heavily on research capacity-building in low and middle income countries. As a research and training program aiming to build capacity in a focused way at collaborating institutions, ICOHRTA fits well with these priorities. The new FIC Strategic Plan for 2008-2012[8] also emphasizes research capacity building. However, the new plan focuses specifically on non-communicable disease and disorder research as a priority for capacity building. ICOHRTA is one of only five FIC programs with a specific focus on non-communicable diseases and disorders.[9] In 2005, FIC invested a total of $9,439,876 in these five programs, representing only 15.0% of total extramural expenditures (Table 3). Expenditures on the same programs increased only slightly in 2007 (to $9,874,363 or 15.6%). It should be noted, however, that a large percentage of FIC expenditures (38.7% in 2005 and 41.6% in 2007) are for programs that include both communicable and non-communicable disease and disorder research.

[8] Available online at: http://www.fic.nih.gov/about/plan/strategicplan_08-12.htm; accessed July 2008.

9 Others include the Fogarty International Collaborative Trauma and Injury Research Training Program (Trauma), Global Research Training in Population Health (POP), International Training and Research Program in Environmental and Occupational Health (ITREOH), and International Tobacco and Health Research and Capacity Building Program (Tobacco).

Table 3: FIC Extramural expenditures in FY 2005 and 2007, by disease focus of solicitation.

	FY 2005	Percent	FY 2007	Percent
Communicable [a]	25823213	40.9%	25176146	39.7%
Non-Communicable [b]	10620017	16.8%	10548541	16.6%
Either [c]	23230015	36.8%	25735220	40.5%
Non-FIC Program or Other	3465144	5.5%	2022278	3.2%
Total FIC dollars	63138389		63482185	
ICOHRTA only	1980727	3.1%	1579724	2.5%

[a] ABC, AIDS-FIRCA, AITRP, EID, GID, ICOHRTA-AIDS/TB, Malaria
[b] ICOHRTA, ITREOH, Pop, Tobacco, Trauma, Brain Disorders
[c] Biodiversity, Bioethics, FICRS, FIRCA, Framework, Genetics, GRIP, IEARDA, Informatics, IRSDA, ISHED, Maternal and Child, Minority/Health Disparities, Stigma

The new FIC strategic plan also heavily emphasizes the emerging field of implementation science as a new priority for research capacity building. The strategic plan describes implementation science as the study of "how to get scientific advances adopted in the real world of the clinic and the community." Although the phrase 'implementation science' is not used in either of the ICOHRTA RFAs, FIC staff confirmed that the operational research component of ICOHRTA was intended to substantially overlap with the areas of inquiry subsumed under the newly-developed FIC definition for 'implementation science.'

The inclusion of implementation research as one of the research and training foci for ICOHRTA is both appropriate and consistent with FIC priorities. However, more attention should be paid to consistency in language and definitions. As a first step, the term 'operational' should be replaced with 'implementation' in both the program title and the solicitation. To further reduce confusion on the part of applicants, FIC should consider making its definition of implementation science as consistent as possible with other programs at NIH.

Recommendation 5: Adjust the language used in the ICOHRTA solicitation regarding implementation research to be as consistent as possible with the language and definitions used in the FIC Strategic Plan, other NIH programs, and across the Federal science agencies.

Specifically, there have been at least four recent solicitations from DHHS agencies for research proposals on similar topics: a series of three Program Announcements from a coalition of NIH Institutes and Centers that includes NIMH and the National Cancer Institute (NCI) entitled "Dissemination and Implementation Research in Health" (PAR-07-086, PAR-06-520, and PAR-06-521) and a Request for Applications from the Centers for Disease Control and Prevention (CDC) entitled "Improving Public Health Practice through Translation Research" (RFA-CD-07-005). While they agree with the FIC definition in broad outline, all four solicitations define 'implementation research' more precisely, emphasizing in particular how it differs from the related fields of dissemination research and diffusion research. These solicitations use nearly identical language to describe dissemination research as the study of the "targeted distribution of information," the intent of which is to "spread knowledge and the associated evidence-based

interventions"; implementation research, on the other hand, is "the use of strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings." Diffusion research is described most clearly in the CDC solicitation as "the systematic study of the factors necessary for successful adoption by stakeholders and the targeted population of an evidence-based intervention which results in widespread use." Diffusion research therefore includes dissemination and implementation efforts as well as the economic, legal, regulatory, and policy contexts in which they occur.

Niche Relative to Other Funders

When asked whether they were aware of other potential sources of funding for activities similar to ICOHRTA, the PIs reported that they were not. In particular, they cited the program's focus on non-communicable diseases and collaborative international research training and capacity building as unique features. Several stated that they did not believe they would be able to obtain funding for similar activities without the ICOHRTA program.

In order to independently investigate whether ICOHRTA represents a unique funding opportunity, information was assembled from publicly available sources about funders of biomedical research capacity building through training for researchers from low- and middle-income countries. As shown in Appendix E, a total of 21 organizations were identified as supporting such training opportunities, including government agencies in high income countries such as the US, Canada, Denmark, France, Norway, United Kingdom, and the European Union; LMIC governments in India, Mexico, and South Africa; Foundations such as Doris Duke and the Wellcome Trust; and NGOs such as the World Health Organization and the World Bank. Of these, a number of organizations appear to pursue similar strategies with respect to research training through bilateral collaboration between institutions in high and low or middle income countries. These include programs run by the Canadian, Danish, EU, French, and Norwegian governments; the Special Programme for Research and Training in Tropical Diseases (TDR); the Doris Duke Foundation; and the Wellcome Trust.

It should be noted, however, that only TDR and Doris Duke are open to participation by US investigators as the high income partner. Doris Duke is also limited geographically to the former Soviet Union and Sub-Saharan Africa, while TDR focuses exclusively on neglected infectious diseases. In fact, of the original 21, only one program was identified with a specific focus on non-communicable disease and disorder research similar to ICOHRTA: the Initiative for Cardiovascular Health Research in Developing Countries (funded by the World Bank via the Global Forum for Health Research). Many of the others focus specifically on communicable diseases, and the rest neither specifically

include nor exclude non-communicable disease and disorder research. Its focus on non-communicable disease and disorder research may therefore be a relatively unique feature of the ICOHRTA program, and ICOHRTA is also one of only three programs known to support bilateral research collaboration between institutions in the US and low- and middle-income countries.

Program Management (FIC-Level)

Overall Program Management

It is worth noting that nearly every PI interviewed went out of his or her way to state that the Program Officer in particular and FIC staff in general have been exceptionally supportive. They described the FIC staff as unusually responsive, flexible, and willing to work with them to overcome any obstacle for the good of the program.

Turkey: Evidence-based National Mental Health Policy

Many Turkish children are exposed to risk factors for mental health problems and developmental disabilities that include poor nutrition, lack of parental education, environmental hazards, enhanced genetic risk factors due high rates of consanguinity (mainly first cousins), and high rates of internal displacement. Three quarters of the country is also considered to be at risk for major earthquakes. In collaboration with the Mental Health Department of the Turkish Ministry of Health, the ICOHRTA based at Children's Hospital organized two national conferences for the purpose of developing Turkey's first evidence-based National Mental Health Policy. Meetings were held in Ankara in December 2002 and March 2003. A draft National Mental Health Policy was submitted to the Ministry in January 2006. The document emphasizes research capacity development and research administration. If enacted, it will have significant long term impact for research and public health throughout Turkey.

Grant Review Process

The first round of ICOHRTA applications was reviewed by a NIMH Special Emphasis Panel in 2001. The 2001 panel included 20 members, all of whom are currently affiliated with US institutions. At least two members are originally from low- and middle-income countries (Mexico and Peru), one was educated in Hong Kong, and two more come from high income foreign countries (Italy and Germany). Based on a review of available biosketches, at least half of the reviewers appear to have had experience conducting research outside the US, and eight of them had been PIs on NIH training awards (T32, D43, or R25). Areas of expertise reported by reviewers included drug and alcohol abuse, infectious disease, health services research, mental health epidemiology, adult psychology, child psychology, nursing, periodontal disease, research ethics, and traditional Chinese medicine. The Program Officer, study section chair, and PIs all agreed that the first round of review was problem- free and satisfactory relative to other NIH review processes with which they had experience.

Although technically out of scope for this evaluation, the second round of review in 2006 is worth considering because there were key differences that substantially impacted stakeholder perceptions of quality. The 2006 review was administered through the Center for Scientific Review (CSR) rather than

NIMH. During the 2001 review, a conference call with the Program Officer and Scientific Review Administrator had been held at the beginning of the review process in order to make sure the study section members understood the program and the review criteria. This did not occur in the 2006 round, and interviewees felt strongly that the process may have suffered as a result. FIC should take all necessary steps to avoid similar problems in the future.

Recommendation 6: In future rounds of review, ensure that at least one pre-review meeting is held to orient reviewers to the unique aspects of the D43 mechanism as well as the ICOHRTA program objectives and review criteria.

The 2006 review also involved use of triage procedures, in which the bottom 50% of applications during the initial round of review are not discussed and scored by the full study section. This procedure was viewed by some interviewees as problematic for ICOHRTA for two reasons. First, the unusually broad range of topics covered by the applications likely increased the probability of a mismatch between the expertise of the initial reviewers and the application under review. Second, many reviewers were also unfamiliar with the capacity-building goals and review criteria typical of a D43 training program. Since the ICOHRTA review, CSR has reduced the percentage of applications that go unscored, which may help to mitigate this problem in the future.

Finally, concerns were also expressed about what the appropriate standard should be for judging progress when considering whether a project should be renewed. One PI whose project was not renewed for the second round expressed disappointment that the reviewers hadn't taken into account what she considered to be substantial barriers that had been overcome at the partner institution. She made the case that, having started with substantially less infrastructure for research than other ICOHRTA partners, the accomplishments of her collaborators (e.g. publications) should not have been compared with other institutions with far more developed research programs at the start of the grant. The panel agrees that this set of circumstances was unfortunate, but the Developmental ICOHRTA award might be a more appropriate mechanism for funding future collaborations with similar barriers.

Recommendation 7: Re-introduce the developmental ICOHRTA awards and broaden their scope to include establishment of basic research infrastructure (e.g. IRBs, lab and computing facilities, trained support personnel) at the foreign institution.

The developmental awards, unavailable during the second round, appear to have succeeded in developing new collaborations suitable for full ICOHRTA status; two of the three ICOHRTA developmental awards made in the first round were converted to regular ICOHRTAs in 2006. However, in the 2001 RFA, the purpose of the developmental ICOHRTA awards was to build new collaborations. Developmental awards might also be appropriate in cases such as the one described above, where there was an existing collaboration but substantial hurdles to be overcome in terms of research infrastructure.

FIC might also consider establishing guidelines for research infrastructure that should be present at the partner institution prior to establishment of a full-scale ICOHRTA. Tthe most recent RFA required only that he MFC "must hold a faculty research position at a public or private non-profit research institution that will allow him or her adequate time and provide appropriate facilities and resources, including access to patients or patient data, to provide mentored clinical, operational or health services research experience for trainees upon return to the home country." For example, it might be appropriate to suggest that MFCs should already have an accredited Institutional Review Board; if they do not, the developmental ICOHRTA might be a better option.

Partnerships and Communication

NIH Program Partners

As mentioned in the background section, a total of four Institutes and Centers (NIMH, NIDA, NCCAM, and NICHD) participated in the initial consultation which was held to develop the ICOHRTA concept in 2001. Three of the four (NIMH, NIDA, and NCCAM) were listed as potential partners on the 2001 RFA along with two additional ICs: the National Institute of Aging (NIA) and the National Institute for Dental and Craniofacial Research (NIDCR). Of these five potential partners, only NIMH, NIDA, and NIA actually contributed funds to ICOHRTA awards in the first 5 years (Figure 2); the Program Officer indicated that NCCAM and NIDCR would have been willing to fund awards in the first round but did not receive applications with a relevant disease focus.

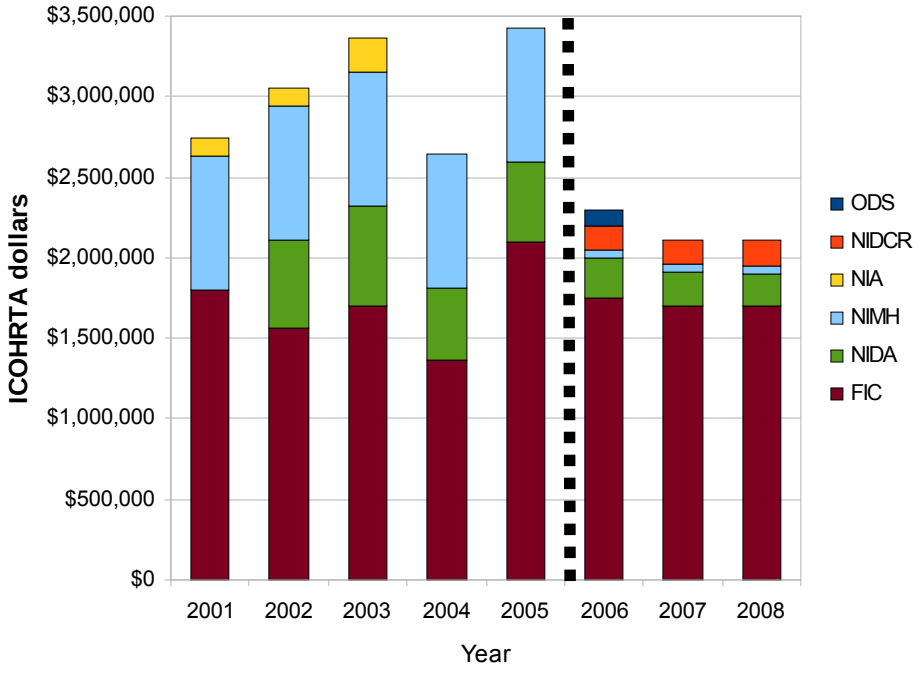

Figure 2: Source of funding contributed to ICOHRTA awards by IC and Project Year (2001 was Year 1). The dashed line indicates the break between the first five years and the second five years.

For the second RFA in 2006, the National Institute of Neurological Disorders and Stroke (NINDS) and the Office of Dietary Supplements (ODS) signed on as program partners, and ODS contributed to an award (Figure 2). NIMH, NIA, NIDA, and NIDCR were also listed as partners on the 2006 RFA. However, the developmental project funded by NIA in the first round was not renewed, and there were no relevant new applications, so NIA is no longer contributing funds. NIMH continued to participate, but its contributions dropped significantly after the first five years (Figure 2). A representative from NIMH characterized the decision as purely budgetary; she expressed continued enthusiasm for the program and sincere hopes that FIC can find sufficient funds to keep it going. NIDA continued to contribute at a relatively constant level (Figure 2), and NIDA program staff expressed enthusiasm for the program in a recent interview. They stated that it is well run and consistent with NIDA's priorities, and they feel their needs are being met.

The declining participation on the part of NIMH and other partner ICs is worrying, although understandable given the budget problems currently faced by NIH as a whole. Although contributions from other ICs may continue to decline for reasons beyond FIC's control, efforts to maintain and expand partnerships should be intensified.

Recommendation 8: FIC should strengthen its efforts to nurture relationships with partner ICs in order to keep them engaged.

Apart from providing co-funding for selected awards, the role for program staff from the partner ICs has been limited to participating in the initial consultation and the Network Meetings. Encouraging them to play a larger role at the Network Meetings might be a good way to start.

Synergy with Other NIH-funded Activities

As mentioned above, the 2001 RFA required that the ICOHRTA PIs have an existing training or centers award on a similar topic. ICOHRTA PIs had a total of 40 active NIH awards in 2001, 26 of which (65%) had educational or training components.[10] During the entire grant period (2001-2007 if renewed, 2001-2005 otherwise), ICOHRTA PIs had a total of 64 other HHS awards.[11] Seven of these were other FIC training awards (D43 or U2R mechanism).[12] Many additional NIH awards held by mentors and collaborators at the US institutions also overlapped in time with the ICOHRTA program.

The PIs and trainees described substantial synergy between the ICOHRTAs and other awards funded by NIH. In particular, those with US-based training programs and a T32

10 Defined to include T32, R25, K30, U2R, and D43 mechanisms as well as centers grants, cooperative agreements, and contracts (P, U, and M series).

11 Counts include awards to the ICOHRTA PI only. For the three awards where there was a change of PI during the award period, awards to both the current and former PI in the relevant years have been included as long as they were made to the same institution. Counts also include one U48 award from CDC and one R13 award from AHRQ.

12 Other FIC training awards were held by five different ICOHRTA PIs at four institutions. They included 3 AIDS International Training and Research (AITRP) awards as well as 1 award from each of the following programs: ICOHRTA AIDS/TB; International Training and Research in Environmental and Occupational Health (ITREOH); Trauma; and Maternal and Child Health.

Institutional Training Grant program described significant synergy, with ICOHRTA trainees often participating in seminars and other activities alongside T32 trainees in the US. Several interviewees described such interactions as beneficial to both the ICOHRTA trainees, who in many cases had little previous experience participating in scientific debate among peers, and the trainees from the US, whose experiences were enriched by the unique perspectives of the foreign students. Some trainees also collaborated on research awards held by the ICOHRTA PIs and by other ICOHRTA-affiliated faculty members, especially when the focus of that research was in the ICOHRTA trainee's home country.

Communication Across ICOHRTA Programs

Both PIs and trainees described the ICOHRTA Network Meetings as a particularly helpful feature of the program. Two Network Meetings were held during the first five years, in 2003 and 2004. A third Network Meeting was held more recently in February2008. Network Meetings are typically attended by the PIs as well as selected collaborators and trainees. In the past, they have been two day meetings that include presentations by the PIs, a poster session for trainee research, presentations by NIH staff members, discussion sessions, and networking opportunities. The first two Network Meetings also included a day-long workshop on grant writing.

Several of the PIs stated that the Network Meetings were well-organized and a good forum for sharing ideas and discussing common problems. Trainees described them as opportunities to network and learn what was going on at other ICOHRTAs. Both groups felt they should occur more frequently, perhaps every year or every other year. Several interviewees, including many trainees, also requested that FIC facilitate additional opportunities for networking and communication, perhaps using lower-cost web-enabled solutions. The panel agrees with both suggestions.

> **Recommendation 9: Increase the frequency of the Network Meetings and explore options for lower cost alternatives to facilitate communication and networking across the ICOHRTAs between meetings.**

In order to reduce travel costs for the Network Meetings, FIC might consider replacing some of them with program-wide videoconferences, perhaps substituting a videoconference for an in-person meeting every other year or using such capabilities to expand participation by additional trainees.

An ICOHRTA-wide internet portal would be the obvious solution for facilitating networking and communication. As highlighted at the most recent Network Meeting, such a solution need not be expensive or elaborate; there are now a number of user-friendly and inexpensive internet-based products and services that might enhance communication among ICOHRTAs. In fact, the same issue appears to have been raised at previous Network Meetings in 2003 and 2004, at which point there were fewer and less attractive commercial options. In response, one of the NIMH partners decided to solicit contracts to develop communication tools for the ICOHRTA program through the NIH

Small Business Innovation Research (SBIR) program. Contractors ended up working with several of the ICOHRTAs to develop webcasting functionality and other communication tools. These tools appear to have been embraced internally by at least three of the ICOHRTAs, but they were never expanded to increase connectivity across the ICOHRTA network as had originally been intended.[13] The technologies involved were not assessed in depth as part of this evaluation, but the panel recommends that FIC should investigate whether, perhaps with the addition of some coordination effort, ICOHRTA could increase the utility of these technologies for improving communication across the Network. The best way to accomplish such coordination is unclear; perhaps a small and informal working group including members from the ICOHRTAs with the most experience using these technologies could be established to make preliminary recommendations. A coordinating center for the ICOHRTAs or for all D43 programs would be another option, but the cost might be prohibitive.

Program Management (Award Level)

Training Strategies and Models

Virtually every ICOHRTA reported pursuing a variety of training strategies, resulting in a broad range of training models. Strategies described by various PIs included:

1. *Master's and PhD-level training at US institutions.* Many PIs described degree-based training as an unaffordable luxury for ICOHRTA, but others considered it critical, especially for institutions struggling to build credentialed faculty in a new department. Some PIs first brought students over temporarily on a trial basis and then allowed the most successful to compete for degree-based training slots. Some PIs also emphasized the importance of keeping faculty at the home institutions involved in order to facilitate re-entry and future career development.
2. *Traditional postdoctoral training at US institutions.* Intended for recent graduates from foreign doctoral and medical programs, this training strategy mirrored the usual experience for postdoctoral researchers in the US.
3. *Re-Entry research grants.* Degree-based and postdoctoral training experiences were often coupled with re-entry funding intended for use in completing a thesis, dissertation, or other research project. Mentoring during the research phase, ideally from faculty in both the US and the collaborating country, was described as key.

[13] Interviewees reported that they were used to improve coordination among some of NIDA's international networks.

4. *US-based training or research experiences for more senior investigators.* This training strategy involved bringing more senior or experienced researchers to the US, usually for the purpose of developing specific skills, collaborating with a US researcher on a particular project, and/or planning research projects to be completed upon return. Duration of training of this type ranged from a few weeks to two years.
5. *Lectures, symposia, and other short-term training in the partner country*. Almost all of the ICOHRTAs engaged in some form of short-term, low-cost training in the partner country. However, some PIs appear to have regarded such activities as more central to their training efforts than others. Many reported using such low-cost measures as a way to advertise the program and recruit candidates for longer-term training.
6. *Mentored research support in the partner country.* Several PIs reported a gradual shift away from US-based training and towards mentored research support in the home country of the trainees. At least one ICOHRTA devotes most of its resources to conducting intensive seminars intended to assist aspiring researchers in crafting research proposals. Seminar participants then compete for funds to complete their proposed studies with mentorship from the ICOHRTA. This strategy requires a very strong coordinating infrastructure in the collaborating country.
7. *Intensive workshops for faculty and/or professionals in the collaborating country.* This strategy was implemented in different ways by the various PIs, but workshops and seminars usually focused on strengthening faculty expertise on particular topics or on research methodologies. PIs described this strategy as a cheaper alternative to US-based training for faculty and also as a way to include individuals who could benefit from intensive training but are not able to travel to the US.
8. *Curriculum development, co-teaching, and informal support for faculty.* One PI reported sending faculty from the US to co-teach courses with faculty at the collaborating institution, and several others reported assisting with curriculum development activities. Faculty members from the US also reported playing less formal roles in developing institutional capacity by making themselves available to review research proposals and protocols, answer questions, and provide general advice and support to faculty members upon request.
9. *Support for students pursuing degrees at foreign institutions.* It does not appear to be the case that ICOHRTA provided direct support (e.g. tuition, living expenses) for students pursuing degrees at foreign institutions. However, at least one PI described identifying PhD students who were already completing degrees at the partner institution and attempting to enrich their training experiences through mentoring and other support. Although existing records are insufficient to conclusively document this phenomenon, it also may be the case that some of the medium or long-term trainees who received non-degree training in the United States were in fact pursuing degrees at their home institutions.[14]

[14] The standard FIC trainee reporting system does not track whether trainees are pursuing degrees at their home institutions, and this information could not be collected systematically for all ICOHRTAs during the evaluation without clearance from the Office of Management and Budget.

In addition, one PI reported an interesting strategy which involved teaching every trainee to use a common protocol for assessment of smoking-related behaviors in medical students. The protocol is non-resource intensive and custom-tailored for research in developing countries. Since every trainee of the program learns this protocol as part of or in addition to his or her main research project, the PI believes that it serves as a "gluing" mechanism to encourage collaboration once the trainees return home.

The panel feels that this broad variety of training strategies is appropriate, and the program should continue to allow PIs and collaborators the flexibility to match training models with the needs of the collaborating institution.

> **Recommendation 10: The variety and flexibility of training strategies is a strength of the ICOHRTA program, and the current trend toward more training activities taking place in the partner country should be encouraged.**

Flexibility to conduct training activities outside the US is a particularly important feature of the program, both because it makes economic and logistical sense and because it can have capacity-building "ripple effects" that don't occur if trainees are brought to the US. Strategies such as curriculum development and co-teaching that contribute to long-term, sustainable research capacity building are also critical although difficult to quantify in terms of concrete outputs.

Strategies for Recruiting Trainees

PIs reported relying on at least three basic strategies to identify and recruit potential trainees. The first was to issue an open solicitation for applicants that might be circulated through universities, government agencies, professional associations, or other institutions as appropriate. A second strategy was to raise awareness of the program while conducting short term training through seminars, workshops, and lectures. A third strategy was to rely on faculty members and other collaborators in the partner country to identify and recruit suitable applicants. The most effective strategy seemed to vary by country, collaborating institution, and training goals. Some PIs reported that it was important to work through their collaborating institutions in order to ensure that there would be institutional support for the trainees in their future careers, but others preferred to cast a wider net.

Most programs reported requiring a written application as a first step. Some also required an in-person or telephone interview. Depending on the magnitude of the training investment being contemplated, some programs required trainees to participate in a preliminary training activity such as a summer institute or seminar. One program described using low-cost distance learning technology to screen potential trainees by setting them a series of preliminary tasks in preparation for training. They reported that this tool was particularly effective in weeding out applicants who did not have the necessary skills or available time to complete the tasks.

Dedication, potential to benefit from training, and match of research interests with potential mentors in the US were described as the most common criteria for selection of trainees. In cases where the trainees were to be admitted to the US institutions, the admissions process followed guidelines for that institution. One PI reported occasional conflict with his department over which trainees should be admitted, but this does not seem to have been a common problem. Several PIs reported that English language skills, a necessary prerequisite for most training in the US, were a major barrier for applicants from certain regions. Some programs were forced to reject otherwise qualified candidates lacking sufficient language skill while others offered language tutoring as part of their training programs.

Most PIs reported little difficulty in identifying an adequate pool of qualified trainees, although many reported that mid-career professionals and people with families (especially women) were the most difficult to recruit for long-term training in the US. To address the family problem, some ICOHRTAs arranged fellowships and other opportunities in order to accommodate trainee spouses. However, several PIs observed that the people they believed could benefit most from training were often the most over-burdened and the least easy to replace, making their institutions reluctant to let them leave for long periods of time. Many of the programs reported a gradual shift towards more training opportunities in the trainees' home country in order to include these trainees while allowing them to continue to meet their professional and family obligations.

Management Issues Identified as Significant by PIs

Issues related to inadequate funding were raised frequently by the PIs. Although pleas for additional funding are hardly unusual, it is worth noting that the ICOHRTA PIs have recently absorbed a $50,000 decrease in maximum direct costs, and many of them have also been negatively impacted by the falling value of the dollar. Exchange rate data for the currencies of selected partner countries (Table 4) indicate that the value of the dollar has fallen particularly steeply in South Africa, Czech Republic, Poland, Brazil, and India.

Table 4: Spot exchange rate on Jan 1 for selected countries of interest, in unit of foreign currency per US dollar, 2002-2008.[15]

Currency	2002	2004	2006	2008	Percent Decrease
Brazilian Reais	2.32	2.89	2.34	1.94	16.37
Chinese Yuan	8.28	8.28	8.07	7.64	7.64
Czech Koruny	35.58	25.75	24.57	21.38	39.9
Indian Rupee	48.26	45.6	44.95	40.45	16.18
Peruvian Nuevos Soles	3.44	3.47	3.42	3.17	7.88
Poland Zlotych	3.96	3.73	3.25	2.87	27.47
South African Rand	12.03	1191.6	6.35	7.22	39.93
Vietnamese Dong	15083	15642	15914	16100	-6.47

PIs described using a variety of strategies for making ICOHRTA dollars stretch as far as possible, including:

- Encouraging collaborating countries and institutions to contribute additional funds and resources;
- Where possible, shifting operations to less expensive regions and countries (e.g. mainland China instead of Hong Kong);
- Shifting as much training as possible to collaborating country to reduce stipend, tuition, and trainee travel costs;
- Using web-based conferencing technology rather than more expensive videoconferencing or face-to-face meetings wherever possible to;
- Choosing cheaper flights and budget hotels in order to hold travel costs for US investigators to a minimum;
- Where feasible, enlisting the help of unpaid volunteers with ties to the collaborating country.

The strategy of seeking commitment of funds and/or resources has the potential to be particularly useful because it has the added benefit of ensuring buy-in on the part of the collaborating country or institution.

Recommendation 11: Require each partner institution to make an appropriate up-front commitment of time, funds, and/or other resources in order to ensure buy-in.

If such a requirement were to be implemented, however, it would be critical to ensure that it did not discourage participation on the part of the institutions and regions most in need of capacity building. It should therefore be implemented in a flexible manner that would allow FIC to adjust requirements to reflect the resource constraints of particular institutions and to waive the requirement entirely when justified by the circumstances.

Apart from the overall decline in available funding, there were a few other funding-related obstacles reported by PIs. For example, in some countries, PIs reported use of intermediaries or other "work around" solutions to transfer funds without incurring excessive losses due to various taxes and tariffs. These problems were generally solved quickly and did not greatly hinder progress.

[15] Source: xe.com, URL: **http://www.xe.com/ict/**, accessed May 2008.

One PI also mentioned that his collaborators had expressed dissatisfaction about what they perceived as a low threshold for administrative overhead for the foreign institution. The D43 mechanism limits facilities and administration (F&A) costs to eight percent of direct costs for both awards and sub-awards. The foreign institution typically receives eight percent of the foreign sub-award, but university policy typically does not allow the US institution to share any portion of the remaining F&A costs with the collaborating institution. The panel views this as problematic because covering F&A costs is essential for building institutional research capacity. While it would be desirable to change US university policies to allow for more equitable sharing of F&A costs, this option was viewed as impractical and too difficult to enforce. Instead, FIC should change its own policy to ensure that adequate funds to cover F&A costs are transferred to the collaborating institution.

Recommendation 12: Allow facilities and administration (F&A) costs for the partner institution to be budgeted as direct costs.

Finally, several PIs raised the issue of transitioning from one PI to another during the award period. A transition at the level of the PI occurred in the case of four ICOHRTA awards from the 2001 cohort. In one case, the PI who took over seems to have been the primary research manager and driving force behind the project all along, so the transition was almost seamless. In two other cases, the transition occurred shortly after the original award was made, so it does not seem to have caused major disruptions. In the fourth case, however, the transition was described as disruptive, requiring substantial effort in order to re-establish trust with the collaborating institution. In all four cases, the transitions were unexpected and due to circumstances unrelated to the program itself.

Process Issues Identified as Significant by Trainees

All of the trainees interviewed described their training experiences as productive and relatively trouble free. A few mentioned experiencing minor administrative hassles (e.g. having to apply for a visa, obtain a driver's license, and deal with university administration) as well as culture shock and homesickness, but for the most part such problems seem to have been minimal. Several trainees expressed gratitude to their hosts, who frequently provided assistance with issues such as finding housing or employment for spouses. While it is difficult to say whether the trainees interviewed were fully representative, evidence suggests that most trainees did not experience major problems during training. In recommending trainees for interviews, PIs were asked specifically to identify trainees who may have experienced such difficulties. Of the two serious problems described by PIs, one was purely personal in nature and the other was related to inadequate English language skills.

Similarly, all of the trainees interviewed who had been trained in the US appear to have made smooth transitions back to their home countries. All had arranged leaves of absence with their home institutions, and in some cases their direct supervisors had urged them to apply for the training in the first place. Several described this institutional support as a critical factor in their decision to participate. Most trainees felt strongly that

the strategy of building long-term relationships between a particular low or middle income institution and a US institution was sound and critical to the success of the program. However, one trainee from an institution that was not the major foreign collaborator expressed frustration with what he viewed as bias towards that institution's students and disappointment that more resources were not available in his own area.

When asked for specific suggestions about how the program might be improved, trainees mentioned the following ideas:

- One trainee suggested that the process of matching trainees with mentors should occur as early as possible so that they can start building a relationship before the trainee arrives in the US.
- One trainee suggested that it would be better to send trainees to the US in larger groups, as having a support group might help them to cope better with inevitable culture shock.
- One trainee observed that the name "ICOHRTA" is very difficult to translate and does not capture the attention of people in his country, even once it is understood. For marketing purposes, he suggested finding a name that is less bureaucratic and more descriptive.
- One trainee suggested that communication about the "nuts and bolts" of the training experience (e.g. availability and use of travel funds) could be improved.

Results

Training and Career Development Outputs

There have been a total of 129 long term trainees and 131 training experiences associated with the program (three trainees had multiple long-term training experiences).[16] Excluding the three Developmental Awards, the average number of long-term trainees per award was 10.09, with a maximum of 17 and a minimum of three. FIC is working on developing benchmarks for comparison of training outcomes across programs, but these data are not yet available.

Slightly more long term trainees were known to be female (46%) than male (40%), but gender was unknown for a large number of trainees (15%). If valid, this observation conflicts with the perceptions of the PIs, who described difficulty of recruiting female trainees because of family concerns. Gender balance of long term trainees appeared to vary greatly among ICOHRTA awards.

ICOHRTA long-term trainees came from 18 countries plus the Hong Kong SAR: Bolivia, Brazil, China, Colombia, Congo, Czech Republic, India, Indonesia, Kenya, Nigeria, Peru, Poland, Slovak Republic, South Africa, Turkey, Uganda, Ukraine, and Vietnam. By region, East Asia & Pacific and Europe & Central Asia together accounted for more than half of trainees (Figure 3).

16 Long-term training was defined as training lasting longer than six months. Counts are based on a roster of long term training experiences assembled from investigator progress reports and sent to the PIs for verification. Reliable counts of shorter-term trainees were not available for most of the ICOHRTA programs during the first five years.

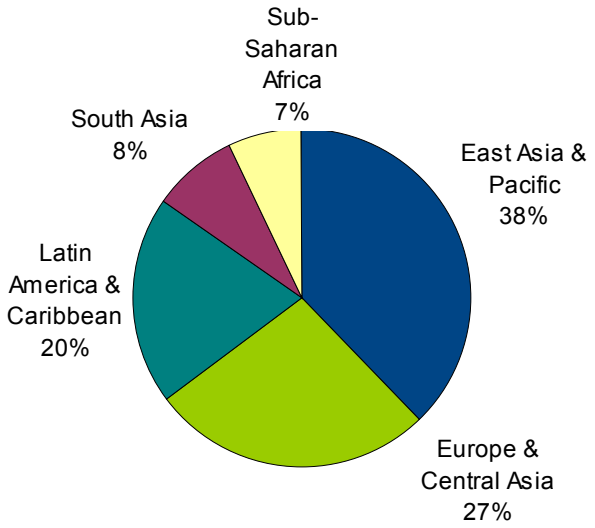

Figure 3: ICOHRTA Long Term Trainees by Region of Origin (N=129)

With respect to type of training, the majority (101 or 75%) of ICOHRTA training experiences did not result in a terminal degree. Most of these trainees already held the equivalent of an MD or PhD, but it is not clear what percentage of these training experiences involved junior investigators (corresponding more closely to the 'postdoctoral' training model in the US) and which were more experienced.[17] Nine percent and 10% of experiences were reported as terminating in a Doctoral or Master's degree, respectively. An additional 6% of training experiences were reported as of unknown types.

The evaluation identified only one long term trainee who did not return to his home country (Ukraine) following training. A second trainee passed away during training. An additional 18 long-term training experiences (14%) were confirmed by PIs as still in progress and 75 experiences (59%) were confirmed as having ended with the trainee returning home. The status of an additional 33 experiences (26%) remains unconfirmed, but more than half of these trainees (19 of 33 or 58%) are presumed to have returned or to still be in progress because the relevant PI was asked during an interview to identify any trainees who had not returned and was unable to do so. No information is available on the status of the remaining 14 training experiences.

Trainees and PIs described a wide variety of benefits from training that they attribute to the ICOHRTA program. These include the following:

- *Additional credential.* For those involved in degree-based programs, ICOHRTA training can be a mechanism for obtaining another credential. However, the number of trainees who have had degrees funded by ICOHRTA is relatively small.
- *Gaining scientific knowledge and research experience.* Trainees described

17 Of the half for which educational background prior to training is known, 43 of 51 or 81% had a doctoral or medical degree.

gaining knowledge in a number of areas, including exposure to new theories and paradigms (e.g. resilience theory) as well as specific research skills, techniques, methods, and protocols. Some also stressed the importance of participating in fieldwork or gaining access to large data sets.

- *Strengthening grant-writing skills.* Many ICOHRTA programs conduct grant-writing workshops specifically intended to improve grant-writing skills and familiarize trainees with NIH and other funders of international biomedical research. Other programs provided less formal advice and mentoring on proposal development as well as protected time to engage in proposal writing.
- *Exposure to 'culture' of research.* Several trainees and PIs commented on the importance of exposure to the culture of research in the United States, especially giving and accepting criticism from peers. This aspect appears to have been especially important for trainees from regions where rigid hierarchies discourage free exchange of ideas.
- *Time set aside for research.* Some trainees described ICOHRTA as an opportunity to temporarily put aside other obligations and demands on their time (e.g. clinical work, administrative responsibilities) in order to focus on their research. This appears to have been particularly important for clinicians who were interested in research but had not previously had time to satisfy their curiosity. Some took advantage of the opportunity to collect preliminary data required to obtain additional research funds.
- *Publications.* Several trainees stated that ICOHRTA participation had allowed them to publish more often, in a shorter time, and/or in higher quality journals than otherwise would have been possible. Some highlighted access to datasets, equipment, and other resources facilitated by ICOHRTA. Others credited the willingness of ICOHRTA-affiliated researchers in the US to review manuscripts prior to submission. The importance of international publications to career advancement appears to vary widely by region, field, and institutional affiliation.
- *Networking and relationship-building.* Many ICOHRTA trainees described participation in the program as an opportunity to build and strengthen relationships with colleagues in the US as well as within their own countries and regions. Several ongoing research collaborations appear to have originated with the program. Some programs also encouraged trainee travel to scientific meetings

Vietnam: Training and Licensing for Mental Health Care Practitioners

In 2005, Vietnam had only 15 child psychiatrists to serve a population of approximately 80 million people. The nation's universities offer no training in clinical psychology and no training specific to child psychiatry (a program in general psychiatry does exist). The Vanderbilt ICOHRTA, which began as a Developmental award and was competitively renewed in 2006, is determined to fill this void by creating both a Master's and PhD-level Clinical Sciences Program at Vietnam National University in Hanoi. The Master's-level program will focus on clinical practice and the PhD program will focus on clinical research. Master's level practitioners are expected to form a distribution network for evidence-based research findings. ICOHRTA participants are also working closely with government officials to establish Vietnam's first set of licensing standards for mental health practitioners.

and other universities for networking purposes.

- *Career credibility.* Some PIs and trainees credited ICOHRTA with helping to draw new people into research careers and/or to motivate individuals to continue in research careers. The idea of creating "career credibility" seemed particularly important in countries such as India, where there is substantial research infrastructure but very little focus on non-communicable disease and disorder research.
- *Advice and mentoring.* Trainees described working closely with mentors while in the United States and in their home countries. Mentors provided review and advice on specific research projects, proposals, and manuscripts. Most trainees interviewed in the review are still in touch with their mentors, and several actively collaborate with former mentors.
- *Building confidence.* Many trainees interviewed described the ICOHRTA training as helping to build confidence in their own research skills. Several described subsequently taking on large projects that they would not have felt equal to without the ICOHRTA training. Some mentioned that the long-term institutional partnership with a top US university helped to generate confidence at an institutional level.
- *Prestige.* Some trainees described gaining prestige from selection by the program and/or participation in international research. However, the extent to which participation was considered prestigious appears to vary by region; anecdotal evidence from interviews suggests that it was more likely to be true in Latin America and Eastern Europe and less likely in China.
- *Access to resources.* Several trainees mentioned that ICOHRTA has provided them with access to resources such as publications and software that have been critical for ongoing research.
- *Personal growth.* Several trainees described the experience as useful in broadening their personal horizons. In some cases, ICOHRTA facilitated travel abroadthat would not otherwise have been possible.

In addition to these benefits, five of the ICOHRTA long term trainees have gone on to compete successfully for FIC Global Health Research Initiative Program R01 awards (Table 5).One of these trainees was unable to accept the award because he subsequently moved to an ineligible country, but he later competed successfully for an R01 award from NIMH.

Table 5: ICOHRTA Long Term Trainees Who Competed Successfully for FIC GRIP Awards

Year Awarded	Trainee/PI	Home Country
2006	Ostaszewski, Krzysztof	Poland
2005	Ran, Maosheng	China
2005	Chan, Sandra	Hong Kong SAR
2003	Ghosh, Saurabh	India
2005	Motlova, Lucie	Czech Republic

An additional long term trainee, Dr. Thanh Cong Duong of Vietnam, is PI on a 2007

Cooperative Agreement from the National Center for HIV, Viral Hepatitis, STDs and Tuberculosis Prevention (NCHHSTP) at the CDC. Several ICOHRTA trainees are also collaborators or co-investigators on new NIH awards to US investigators (see below).

Finally, there is also some evidence that participation in ICOHRTA has been beneficial to the careers of the PIs. One PI, Dr. Linda Cottler of Washington University of St. Louis, received the 2008 NIDA International Program Award of Excellence in Mentoring in part because of her contributions to ICOHRTA.

Publications and Other Research Outputs

One hundred and forty-seven research projects were identified from the progress reports as supported through ICOHRTA resources (Appendix F). [18] Because it is of particular interest to FIC (see Strategic Role for ICOHRTA below), an effort was made to determine how many of these research projects could be characterized as 'implementation research.' For the purpose of classification, an operational definition for 'implementation research' was developed (please see Appendix G for details). Of the 147 research projects described in progress reports, a total of 17 projects (12%) were classified as likely precursors to implementation research and 24 projects (8%) were classified as actual implementation research. The vast majority of the remaining 80% appeared to be more traditional clinical or epidemiological studies, with a small minority of projects focused on health services research.

A total of 381 peer-reviewed journal articles are known to have been associated with ICOHRTA awards, as are an additional 47 non-peer reviewed publications such as book chapters, books, and policy documents (Appendix H).[19] Of these, only 50 publications (13%) appear to have cited the grant in PubMed, although it should be noted that not all of the relevant journals are indexed on PubMed. A long term trainee was the first author on at least 140 ICOHRTA publications (37%) and any author on 208 ICOHRTA publications (55%).

The program's overall publication rate appears to have peaked in 2005, which is four years after the original awards were made in 2001 (Figure 4).[20] Excluding developmental awards, the average number of peer-reviewed publications per award was 33.18, with a maximum of 82 and a minimum of three.

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[18] This count includes all projects for which PIs included a title in Progress Report Table 3; however, it may underestimate the total number of research projects to which ICOHRTA has actually contributed.

19 A master list of publications associated with ICOHRTA awards was assembled from investigator progress reports, renewal applications, data reported to the program officer, and PubMed-indexed articles reporting an ICOHRTA award number from the first five years as a source of support. For publications reported as *submitted* or *in press* or for which reported citations were incomplete, references were checked against PubMed and completed if they could be verified. Those that could not be verified were eliminated unless they had been reported in a journal or other format that is not indexed on PubMed.

20 An effort was made to include the most recent publications reported by the PIs in anticipation of the Network Meeting in February 2008, but the apparent drop-off in publications in the most recent years (2007-09) may be attributable to publication and reporting delays.

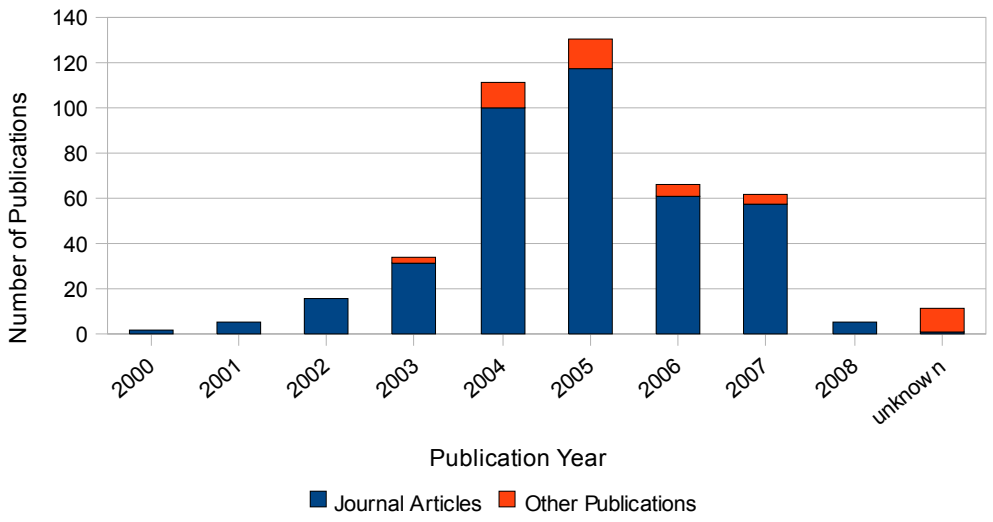


Figure 4: Count of ICOHRTA Publications in Peer-Reviewed Journals by Year of Publication

The highest 'impact' journals[21] in which ICOHRTA publications were published include include *Lancet* (impact factor 25.8), *Journal of the National Cancer Institute* (15.27), *Archives of General Psychiatry* (13.94), *American Journal of Psychiatry* (8.25), and *Annals of Neurology* (8.05). For the 218 publications (55%) for which a journal impact factor was available, the mean impact factor was 3.39 and the median was 2.2.

In addition to publications, several PIs reported the development of research tools such as measures for mental health constructs and nutritional databases that are adapted specifically for use in specific collaborating countries. These PIs explained that such work often goes unpublished because it is of limited interest to the international community, even though it can be extremely important for local research capacity building. Conversely, they described feeling pressure from the international community to perform studies such as cross-cultural comparisons, which are often of great interest to the international community but can be of limited relevance for building capacity, particularly in the earliest stages. They urged FIC and the review panel keep this tension in mind when evaluating the scientific outputs of the ICOHRTAs.

Capacity Building Outcomes and Impacts

In addition to training and research outputs, the review documented a number of other capacity-building outcomes during the first five years of ICOHRTA. These included the following:

Leveraged funding from NIH. Examples of new NIH grants made directly to former trainees have already been described under training outputs; these include several R01 awards through the FIC GRIP program. Trainees emphasized the importance of ICOHRTA grantwriting workshops, contacts, and mentorship in obtaining these awards.

21 Based on the Thomson Scientific Impact Factor for 2006.

In addition, there have been at least three cases of new NIH awards to US investigators with collaborators in developing countries that resulted directly from preliminary research and contacts made through ICOHRTA. These include an FIC Trauma award funding work in Poland (PI: Blow, D43TW007569), a NIDA R01 award funding work in the Ukraine (PI: Schumacher, R01-DA018240), and a FIRCA award funding work in Turkey (PI: Shenton, R03-TW0081340). The FIRCA award may be particularly significant because the foreign collaborator is a long term trainee (Dr. Ozgur Oner of Turkey) and because continued capacity-building at the foreign institution is an explicit goal of the FIRCA program.

Leveraged funding from other sources. In addition to leveraging additional NIH funds, PIs and trainees credited ICOHRTA with helping to leverage additional funds from from sources beyond NIH, significantly including funding sources in low and middle income countries. Examples include:

- A recent award from Vietnam National University to current ICOHRTA trainee Dr. Minh Dang Hoang for development of a library of psychological measures for Vietnam;
- An award from the Polish Ministry of Science and Higher Education to long term trainee Dr. Krysztof Ostaszewski for studying adolescent substance abuse;
- An award from the Indian Council of Medical Research to long term trainee and current collaborator Dr. Deepa Mohan for a nationwide diabetes survey in India;
- An award from the Hong Kong governement to long term trainee Dr. Sandra Chan for psychoautopsy work.

Contributions to institutional infrastructure. ICOHRTA was described as having played a role in helping institutions to establish new curricula, research facilities and degree-granting programs. Examples include a drug research unit at the Universidad Peruana Cayetano Heredia in Peru, a community medicine/epidemiology program at a regional university in India, Vietnam's first doctoral program in psychiatry, and Poland's first bioinformatics program. The program is also credited with improving research capacity on a smaller scale, such as by helping to set up a certified IRB at a small regional university in the Ukraine that has continued to operate even though the ICOHRTA that helped to create it has not been renewed. Similarly, in Poland, one trainee described having used ICOHRTA funds and contacts to set up a small library of scientific books and articles for his colleagues.

Contributions to projects with national significance. ICOHRTA was also credited with playing a role in public health and policy projects of national significance. Examples include contributions to an evidence-based National Mental Health Policy for Turkey, an ongoing national-scale diabetes survey in India, a course in STD bioethics that is now used by all medical schools in Porto Alegre, Brazil, and Vietnam's current efforts to establish its first licensing standards for psychiatric professionals.

Contributions to regional disaster preparedness. There is also some evidence that ICOHRTA has helped to build infrastructure for disaster response efforts, especially in the area of mental health. At least four long term trainees from two different ICOHRTAs are known to have been involved in the response to the devastating 2008 earthquake in Chengdu, China. One of the four described using models to which she was exposed during her ICOHRTA training experience to help conceptualize efforts to help build infrastructure for mental health care in the region. Some of the earliest ICOHRTA research also contributed to recovery efforts in the aftermath of the 1999 earthquake in Izmit, Turkey.

Establishment of new professional societies and formal research networks. ICOHRTA has played a key role in developing at least four new national professional societies. Examples include a Polish Society for Addiction Research, a Peruvian Addiction Medicine Society, a Non-Communicable Disease Network in India, and a Child Psychology professional organization in Turkey. In at least one case, the professional association was formed in direct response to a need identified by a government official during a conversation with the ICOHRTA PI.

Development of informal networks of researchers. The development and strengthening of less formal networks of researchers in the partner country was also described as important outcome of the ICOHRTA programs. For instance, one PI described how he had used the connections developed through ICOHRTA to quickly address new research questions as they arise. The specific example he gave was quickly establishing capacity to monitor instances of mass hysteria in Vietnam. The same PI also mentioned having

India: Nationwide Diabetes Survey

India is believed to have the highest prevalence of diabetes and the largest number of diabetics in the world, and trends towards increased urbanization and rising incomes will almost certainly intensify the epidemic. Cardiovascular disease (to which many Indians are believed to be unusually susceptible) and other non-communicable diseases and disorders are also on the rise. The ICOHRTA partnership between the University of Alabama Birmingham and the Madras Diabetes Research Foundation of Chennai, India aims to build capacity for research to address these issues. The ICOHRTA supports a number of training activities, including an annual National Seminar on Epidemiology of NCDs; intensive workshops for MDRF faculty and staff; and frequent videoconferences to provide support and mentoring. ICOHRTA has contributed to a number of important research projects, including a large (26,000 subjects) cohort study of urban and rural prevalence of diabetes and various follow-up studies. ICOHRTA has also contributed to the Prevention Awareness Counseling and Evaluation (PACE) Diabetes Project, which aims to create diabetes awareness in urban and rural India through large-scale educational initiatives, screen 200,000 individuals, and implement a primary prevention program in the urban community through lifestyle interventions. Methods developed and tested as part of these projects have been used in the planning for a nationwide diabetes survey which is just getting underway. MDRF faculty described ICOHRTA as critical to this effort because of contributions made by UAB staff members in providing methodological advice and reviewing materials. ICOHRTA was also credited with helping to build institutional confidence, giving MDRF greater national visibility through the annual national seminar, and facilitating contacts with collaborators throughout the country.

been in a position to offer help and connections to nonprofit groups looking to establish additional programs in Vietnam.

Attracting importation regional and international meetings. The ICOHRTAs were cited as critical in attracting annual meetings of the International Association of Child and Adolescent Psychology to Istanbul, Turkey and the Latin American STD Association Meeting to Porto Alegre, Brazil. While this may seem less significant relative to the other capacity-building outcomes described above, it should be noted that the PIs and trainees described an important psychological impact for the community of researchers in those cities and countries from receiving this kind of international recognition.

Conclusion

The panel was impressed with the capacity-building accomplishments of the ICOHRTA partnerships during the first five years. As the first cohort of ICOHRTA awards demonstrates, the range of activities that can meaningfully be described as 'training' is very broad, with different kinds of training activities aiming to build different kinds of research capacity at a variety of levels (e.g. individual, institutional, national, regional). The ICOHRTA solicitation's lack of specificity with respect to capacity-building objectives at the program level appears to have allowed PIs the flexibility to address the equally broad range of capacity-building needs at the collaborating institutions. Essentially, it has given a creative and extraordinarily dedicated group of PIs and collaborators the freedom to negotiate and pursue their own capacity-building priorities.

Somewhat paradoxically, however, this vagueness at the level of program goals made it difficult to determine whether the program had succeeded in meeting its own goals as stated in the 2001 RFA. The extreme sensitivity of capacity building to context makes it difficult to measure and even more difficult to aggregate across an entire program. As a first step towards improving ability to document success, the panel recommends establishing specific capacity-building milestones set collaboratively by the PI and the partner institution for each ICOHRTA.

> **Recommendation 13: Require each ICOHRTA to set milestones for itself, and monitor progress relative to the milestones at regular intervals.**

These objectives should be based on a detailed analysis of capacity-building needs for the collaborating institution and should include quantitative or qualitative indicators by which progress will be measured. This approach would have the advantage of retaining the flexibility that has been a defining feature of the program while simultaneously increasing transparency and accountability. In some cases, explicitly including the collaborating institution in the needs assessment process might also help to increase commitment and buy-in on the part of the collaborators.

Although it will be challenging, the panel believes it would also be beneficial to develop and refine a set of indicators at a program level to facilitate monitoring and evaluation.

Recommendation 14: Develop a set of outcome indicators against which future success of the ICOHRTA program as a whole will be measured, and re-assess those indicators regularly using information from annual reports and future program evaluation efforts.

These indicators should be designed specifically to include a broad range of measures to reflect the diverse capacity-building activities and outcomes of the ICOHRTA program.

Comments from the Program Officer

The ICOHRTA program re-competed for new and renewal awards in 2006. Several changes were made to the program in the second program announcement and more are contemplated for the future.

Some of the key changes included:

- A partner IC was not needed for co-funding so all non-communicable areas/topics were allowed.
- The required parent grant was changed from a training to a research grant and included research by any of the major faculty to underpin the research training focus of the program.
- Allowable direct costs for renewal awards were trimmed to $200,000 USD and new awards to $150,000 USD due to budget constraints.
- Retained original partners except for NCCAM and new NIH partners signed on (NINDS).
- Encouraged as much research and training as possible to occur at the foreign site
- Allowed the creation of research training networks involving other foreign institutions and sites both within and outside of the original host country for renewal programs that were well established at their original foreign institutions.
- Encouraged innovative training and communications strategies.

Possible Future Changes:

- Change to an umbrella program announcement (in discussion and development)
- Emphasizing Implementation Science
- Reintroduce planning grants
- Allowing applications directly from foreign sites.
- Investigate ways to better track and network grantees and trainees
- Continue to encourage additional funding partners to join

Appendix A: Biographical Information on Review Panel Members

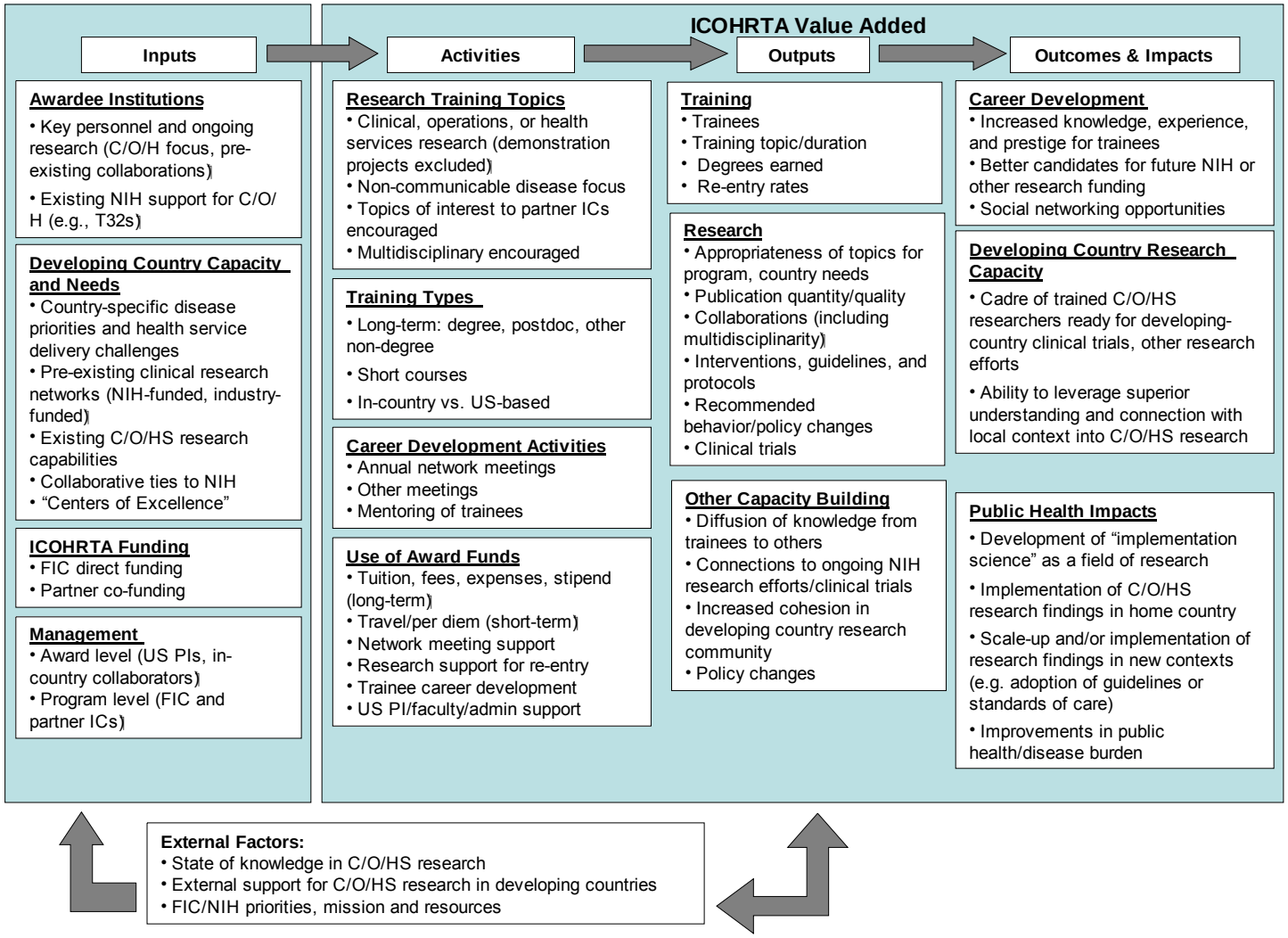
Gregory A. Aarons, PhD
Gregory Aarons, Ph.D. is Associate Professor in Residence in the Department of Psychiatry at the University of California, San Diego School of Medicine. His research focuses on identifying and improving organizational factors that impact quality of mental health care and social services and on the implementation of evidence-based practices in real-world practice settings. Dr. Aarons' most recent focus is on the role of leadership in evidence-based practice implementation and the effects of targeted implementation strategies on organizational functioning, service provider functioning, and implementation effectiveness. Dr. Aarons developed the Evidence-Based Practice Attitudes Scale (EBPAS), which assesses service provider attitudes toward adopting evidence-based practices and is currently in use in local, statewide, national, and international studies. He has been the a lead author or the lead methodologist on studies using multilevel growth mixture modeling with categorical data, multilevel survival analysis, multilevel structural equation modeling, multilevel factor analysis, and a number of scale development and/or psychometric evaluation studies. Dr. Aarons is Associate Editor of the journal *Implementation Science* and is on the editorial board of *Administration and Policy in Mental Health and Mental Health Services Research*. He also serves as a standing member of the NIMH *Mental Health Services in Specialty Mental Health Settings* review committee (SRSP).

Sharon Fonn, PhD
Dr. Sharon Fonn is Professor and Head of the School of Public Health at the University of Witwatersrand in Johannesburg, South Africa. She has conducted research to inform policy development and implementation in reproductive health over a ten year period. At the national level, this has included the development of a number of specific policy proposals for the development of reproductive health care services in South Africa. Internationally, she has worked in various capacities with agencies including the World Bank, WHO, UNICEF, UNFPA, DfiD, and SIDA. Her areas of expertise include health systems development, gender equity, and conceptualizing and managing multi-center studies.

Deborah A. McFarland, MPH, MSc, PhD
Dr. Deborah A. McFarland is Professor in the Department of Global Health and the Department of Health Policy and Management at the Rollins School of Public Health of Emory University. Her specialty is international health care financing and health policy. Dr. McFarland has been involved in health policy and health financing issues for the past 25 years with particular interest in the interface of disease control programs and health systems, and the ethics and economics of resource allocation for public health priorities, primarily in sub-Saharan Africa. She is currently a member of the WHO technical consultative committee for the Africa Programme on Onchocerciasis Control (APOC), the WHO technical committee on the economics of trypanosomiasis, the WHO/UNICEF Tropical Disease Research Special Advisory Committee and the Mectizan Expert

Committee for neglected tropical diseases. Dr. McFarland served in the Peace Corps in Liberia, worked as a health services specialist for the United Mine Workers Health and Retirement Funds in central Appalachia and the director of a network of primary care clinics in the same region. She was a Robert Wood Johnson Fellow in health policy and finance and worked with the National Governors Association on Capitol Hill. Dr. McFarland holds a PhD.in strategic management and industrial organization economics, an MSc in economics, an MPH in health policy and a BA in philosophy.

Appendix B: Program Logic Model



Appendix C: Evaluation Study Questions

A. Program Planning

1. What are the program goals and have they changed over time? How were they developed?
2. How do the ICOHRTA program goals align with: a) the FIC strategic plan and other FIC strategic initiatives (at the time of implementation); b) the new FIC strategic plan (especially with respect to implementation research); and c) strategic plans and initiatives elsewhere at NIH?
3. To what extent does there exist underlying research capacity in implementation research in developing countries?
4. Are other funders supporting similar research and capacity-building? Does ICOHRTA fill a "funding gap"?
5. Are there alternate mechanisms/models/strategies for meeting program goals that might be considered?

B1. Management-- NIH Level

6. What is the current grant review process, and does it appear to be adequate?

B2. Management-- Award Level

7. What strategies have been planned and/or employed to prevent "brain drain"?
8. What is the process for trainee recruitment and selection? Does it appear to produce a diverse and talented pool of trainees?
9. What types of support and mentoring are available to trainees? Do trainees have access to equipment, supplies, living expenses, courses, etc.? Do grantees plan for the long-term career development of trainees?
10. Does level of funding and allocation of funds at the project level appear to be adequate?

C1A. Partnerships-Program Level

11. What has been the role of partnerships with other ICs, and what is the partnership model? What is the process at FIC for managing partnerships?
12. Are the needs of the partners being met? Do they plan to continue the partnership?
13. Are there additional potential partners who have not been approached or have declined to participate? If yes, how might they be approached/encouraged?
14. Do the IC partners consider ICOHRTA in planning for related initiatives? If yes, what is the process?

C1B. Partnerships-Award Level

15. Are ICOHRTA PIs/trainees connected with large-scale research networks or other NIH-funded awards/efforts on relevant topics?
16. Are the cities/institutions of the developing-country collaborators “Centers of Excellence”? If yes, is there a connection between the ICOHRTA and the center of excellence?

C2. Communication

17. What strategies do awardees/trainees use or plan to use to disseminate knowledge/skills to other researchers in-country in order to build capacity?
18. Do awardees/trainees communicate or plan to communicate with policy-makers in developing countries? How about with the general public?

D. Results

19. What have been the research outputs of the ICOHRTA program, if any?
20. What have been the training outputs of the ICOHRTA program?
21. What have been the networking/career development and other capacity building outcomes of the ICOHRTA program?
22. Does the ICOHRTA program attract and/or foster the development of interdisciplinary collaborations?

Key Evaluative Questions

1) What should be the priortities for capacity-building in the area of implementation research?
2) Does the ICOHRTA RFA reflect those priorities? Would you recommend any specific changes to the RFA?
3) Should alternative methods/models/strategies for meeting the program goals be considered?
4) Do the research, training, and other capacity-building efforts that have taken place so far appear to have been appropriately focused?

Appendix D: Interview Discussion Guides

Discussion Guide for PI Interviews

Application Decision and Process

1. How did you first hear about ICOHRTA, and why did you decide to apply? Did you have pre-existing ties to your partner countries and institutions? If not, how did you decide which countries to work in?

2. Are you aware of other funders active in these areas [international training for clinical, health services, implementation research]? Do you think ICOHRTA fills a "funding gap"?

3. Did you have any issues with the application and review process? Did it differ substantially from other application and review procedures you've participated in?

Award Management

4. What was your overall strategy for making use of training funds? Approximate cost per trainee?

5. Did you encounter any difficulties due to restrictions on use of funds?

Training

6. What process do you use to recruit and select trainees? Have you had any problems finding enough qualified candidates?

7. Please describe the training model/training-related activities. Have certain activites been more successful than others? Where does training take place?

8. How do you match trainees with mentors? What types of interactions typically occur between trainees and mentors?

9. What is the relationship between your ICOHRTA and the parent award?

10. Have trainees who have completed training returned to their home countries, and do current trainees intend to return?

11. In what ways do you think that participating in ICOHRTA has been beneficial to your trainees? Their home institutions?

Research

12. How would you classify your trainees' research with respect to the RFA categories (Clinical, Operations, Health Services)? Would you classify what they do as 'implementation research'?

13. Can you think of examples where the ICOHRTA experience has helped to push trainees in research or career directions that they wouldn't otherwise have followed?

14. Are the research topics pursued by your trainees are well matched with the needs and priorities of your partner country or countries?

15. Aside from publications and presentations, have there been any important research products that the panel should be aware of?

Communication and Infrastructure

16. Does your ICOHRTA have any connection to large-scale NIH research networks or other NIH-supported research efforts on similar topics and/or in your partner country?

17. Has your ICOHRTA helped to strengthen research infrastructure in your partner country? (e.g. strengthening networks, forming professional societies, etc)

18. Have you had any contact with policy-makers or other non-scientists in your partner country? If yes, what was the result?

Overall

19. Do you have any suggestions for improvement to the ICOHRTA program?

20. Is there anything else you think the expert panel should know about your ICOHRTA or about the program in general?

Discussion Guide for Trainee Interviews

0. What was your background prior to ICOHRTA? (Degrees, point in career)

1. How did you first hear about ICOHRTA, and why did choose to get involved?

2. Please describe your ICOHRTA training experience. Did you visit the US? Did you take courses or earn a degree? Did you participate in a specific research project? Did you have a mentor or mentors?

3. Do you think you have benefited from the training experience? In what ways (specific knowledge, career enhancement, networking, data, prestige, other)? Can you give any specific examples?

4. Did you encounter any difficulties during your ICOHRTA experience?

5. (If came to US) Did you encounter any difficulties when you returned to your home country? (Or, if not yet returned, do you anticipate any?)

6. Have you had opportunities to share the knowledge you've gained from your training with others in your country?

7. Do you have any suggestions for FIC about how to improve the ICOHRTA program?

8. Is there anything else you think FIC should know about your experience?

Discussion Guide for Partner Interviews

1. How and when did you first learn about the ICOHRTA program?

2. Did your IC participate in developing the program goals?

3. What made the program attractive to your IC?

4. Where do you see ICOHRTA relative to your IC's strategic priorities? Does your IC work on similar topics? In the same countries? Can you describe any barriers to funding this type of research that you've encountered?

5. Are you aware of any direct links between ICOHRTA and your IC's initiatives (e.g. trainees participating)?

6. Do you have a general sense of where in the developing world research capacity in these areas [implementation, clinical, health services research] currently exists? Are there regions you think should be targeted? Are there subfields/diseases/topics that should be targeted?

7. Are you aware of other funders active in these areas [training for clinical, health services, implementation research]? Do you think ICOHRTA fills a "funding gap"?

8. Do you know of any alternative mechanisms/models/strategies that should be considered for meeting the ICOHRTA program goals?

9. Are your IC's needs being met by the program? Do you plan to continue participating?

10. Are there any specific improvements that you would make the program more attractive to your IC?

11. Is there anything else you want the expert reviewers to know about ICOHRTA?

Discussion Guide for Reviewer Interviews

1. Please tell us about the review process for ICOHRTA: How did it compare with other reviews you have participated in?

2. Can you describe the areas of expertise of the panel members? Were there any members from developing countries?

3. Were the criteria clear and easy to apply?

4. Was the strength of the developing country collaborator and institution considered in the review process?

5. Was there any significant disagreement about participants regarding how to interpret the criteria? Any other problems or anomalies?

6. What elements were present in the best ICOHRTA proposals? Did strong proposals contain common elements?

7. How would you rate the overall quality of the applications, relative to other reviews?

8. Is there any additional information about the applicants/proposals that you wish had been available?

9. Is there anything else you think the expert review panel should know?

Discussion Guide for Program Officer Interview

Program History and General

1. Please tell us about the history of the program: Where did the idea come from and how was it developed?

2. What was the process for setting the program goals? Who participated? What were their contributions/issues?

3. Why clinical/operational/health services combination? What were the intended boundaries? Was the focus intended to be on 'implementation' research?

4. Have the goals changed or evolved over time?

Strategy and Role

5. Where do you see ICOHRTA relative to FIC's strategic priorities as they existed when the program began? How about now? NIH priorities?

6. Do you have a general sense of where in the developing world research capacity in these areas [implementation, clinical, health services research] currently exists? Are there regions you think should be targeted? Are there subfields/diseases/topics that should be targeted?

7. Are you aware of other funders active in these areas [training for clinical, health services, implementation research]? Do you think ICOHRTA fills a "funding gap"?

8. Were alternative mechanisms/models/strategies considered for meeting the program goals? If yes, what were they and why rejected? If no, can you think of any?

Management

9. Do you think the size of the program is appropriate (size/duration/number of awards)? Might there be benefits to expanding/shrinking it?

10. Please tell us about the review process: Can you describe the expertise of the panel members? Were there any from developing countries? Are you aware of any issues/problems with the grant review?

11. Are you aware of any additional management or administrative issues that have been encountered?

Partnerships

12. What has been the role of partnerships with other ICs?

13. What is the partnership model and the process at FIC for managing partnerships?

14. Have there been any problems?

15. Have you approached potential partners other than the current participants? If yes, what response did you get? If no, why not?

16. Apart from making more total dollars available, do you see any significant benefits to partnerships? How about costs?

Overall

17. Relative to other FIC programs you're familiar with, how would you rate the success of ICOHRTA?

18. What do you think have been the biggest accomplishments to date?

19. Have any aspects of the program been less successful, in your opinion?

20. Is there anything else you think the expert panel should know about ICOHRTA?

Appendix E: Non-NIH Support for Biomedical Research Capacity-Building Through Training

Name	Category	Model(s) for RCD	Focal Disease/Topic	Geographic Focus
CDC Field Epidemiology Training Programs	US Gov't	Funds Master's level training in epidemiology at LMIC institutions	epidemiology	Worldwide
Fulbright Program	US Gov't	Sends US fellows abroad and brings foreign fellows to the US	open to all topics	Worldwide
CRDF	US Gov't	Fund cooperative research between US and FSU; support university training infrastructure in FSU; match FSU innovators with industry partners	science and engineering (some basic biomedical)	Eastern Europe and FSU
Humphrey Fellows Program	US Gov't	Provides one year of non-degree training for foreign fellows at US institutions	public health and public policy	Worldwide
European Union: European and Developing Countries Clinical Trials Partnership	High-Income Gov't	Funds clinical trials as well as related training, infrastructure development, networking, and coordination in LMICs	HIV, malaria, TB	Africa
Denmark: Danish Research Network for International Health/DANIDA	High-Income Gov't	Funds bilateral research collaboration between LMIC and Danish institutions; mix of research support and degree-based training	ID, health systems	Projects in Egypt, Sub-Saharan Africa, South Asia, Vietnam
Government of Norway programs - includes NORAD, RCN, SIU	High-Income Gov't	NUFU program funds bilateral collaboration between Norwegian institutions and LMIC institutions including research, degree-based training, development of degree programs, training for personnel, and dissemination of research results	mostly HIV/AIDS	7 main partner countries and 18 additional; health work concentrated in Africa
UK Medical Research Council - The Gambia Laboratories	High-Income Gov't	Conducts research, training, infrastructure through laboratory complex located in The Gambia	ID, vaccines, nutrition, genetics	Sub-Saharan Africa; other partnerships worldwide
INSERM (France)	High-Income Gov't	Funds collaborative research with LMIC institutions; training; partnerships with hospitals for clinical research	biomedical and public health	Algeria, Argentina, Brazil, Chile, China, Czech Republic, India, Mexico, Morocco, Nigeria, and Tunisia

Name	Category	Model(s) for RCD	Focal Disease/Topic	Geographic Focus
Canadian Global Health Research Initiative (GHRI) - includes CIHR, CIDA, Health Canada, IDRC	High-Income Gov't	Consortia including LMIC and Canadian partners--includes funding for research, training, and "linking research with users	global health	TBD
Swedish International Development Cooperation Agency/Department of Research Cooperation (Sida/SAREC)	High-Income Gov't	Fund bilateral research collaboration with partner countries.	health policy, tropical and infectious disease, HIV/AIDS, reproductive and child health, environmental medicine	Worldwide, but health work concentrated in Africa
Indian Council of Medical Research	LMIC gov't	Funds research and training projects	Indian disease burden	India (but open to applicants from other developing countries)
Mexican Research Council	LMIC gov't	Funds research and training projects	science and engineering (some basic biomedical)	Mexico
South African Medical Research Council	LMIC gov't	Funds research and training projects	SA disease burden	South Africa
Wellcome Trust	Foundation	Fund bilateral collaborations between LMIC and UK researchers; some direct support of LMIC research including fellowships; new consortium-based Research Capacity Strengthening in Africa Initiative	public health, ID	Worldwide, focus in Africa
Doris Duke Foundation	Foundation	Funds consortia (with LMIC co-leaders) to develop integrated frameworks for care delivery and research. Also funds fellowship-based clinical research training.	ID, implementation research, clinical research	Sub-Saharan Africa
Canadian Coalition for Global Health Research	NGO	Raises awareness and funds for global health research; also conduct summer institute for new researchers and facilitates networking	global health	Worldwide
Institut Pasteur	NGO	Conducts global health research in France and network of laboratories worldwide; provides training and research opportunities to LMIC researchers	ID	Worldwide
International Clinical Epidemiology Network	NGO	Funds some training through workshops and short courses, other research coordination	mix of communicable and noncommunicable	Worldwide

Name	Category	Model(s) for RCD	Focal Disease/Topic	Geographic Focus
		and support activities		
World Health Organization/TDR	NGO	Funds collaborative research, training for LMIC researchers, capacity-building projects	neglected ID	Worldwide
GFHR/WHO-Initiative for Cardiovascular Health Research in Developing Countries (IC-Health)	NGO	Funds collaborative research projects, some training, and networking/coordination activities for LMIC scientists	cardiovascular disease and diabetes, implementation research	Asia, Africa, Middle East, South America

Appendix F: Funded Project List

Award Number	Project Title	Project country
TW005795	Sexual risk and bridging behaviors among young people in Hai Phong, Vietnam	Vietnam
TW005795	Study on HIV-1 and hepatitis C seroprevalence, and predictors of HIV riskassociated behaviors among drug users 15-30 years old	Vietnam
TW005795	Prevalence and characteristics of drug users in Ha Long, Quang Ninh, Vietnam	Vietnam
TW005795	Facilitators of and barriers to HIV testing and counseling among male injecting drug users in Nam Dinh, Vietnam	Vietnam
TW005795	Survey on sexual behavior, knowledge and attitudes related to STD/HIV infections among villagers in Laocai province of Vietnam	Vietnam
TW005795	HIV prevalence in pregnant women in Hai Phong, Vietnam: factors associated with reluctance to take the HIV test and failure to return for test results	Vietnam
TW005795	The sexual behavior and prevalence of HIV in clients of sex workers in Northern Vietnam	Vietnam
TW005795	Identifying HIV transmission from injecting drug users to commercial sex workers in Hanoi, Vietnam	Vietnam
TW005795	Factors associated with HIV infection and sexually transmitted diseases among migrant workers in Ho Chi Minh City, Vietnam	Vietnam
TW005799	Impact of recently acquired HIV infection on tuberculosis-specific and cytomegalovirus-specific IFN gamma production by T-cells	Brazil
TW005799	Analysis of the HIV clinical service database for the city of Santos, Sao Paulo	Brazil
TW005799	Will serodiscordant partners participate in a study of HIV transmission?	Brazil
TW005799	Factors associated with repeat HIV testing in a VCT in Goiania, Goias	Brazil
TW005799	Isoniazide primary prophylaxis for tuberculosis in HIV seropositive patients: a double blind randomized clinical trial	Brazil
TW005799	Survey of HIV seroprevelance, markers for hepatitis and syphillis, and assessment of correlated behaviors for young women residing in three health regions of Vitoria, Brazil	Brazil

Award Number	Project Title	Project country
TW005799	Evaluation of the relation between motivation to donate blood and risk of HIV infection, Sao Paolo, Brasil	Brazil
TW005799	Ecological study of HIV vertical transmission in areas with different vaccine coverage in Porto Alegre, RS	Brazil
TW005799	HIV incidence in a voluntary counseling and testing service in Campo dos Goytacazes, Rio de Janeiro	Brazil
TW005799	Cost-effectiveness of an in-house PCR of tuberculosis in Porto Alegre, RS	Brazil
TW005799	Comparison with an in-house PCR of commercial kits for diagnosis of C. trachomatis, Rio Grande do Sul	Brazil
TW005799	Oral manifestations in HIV infected patients in Salvador, Bahia	Brazil
TW005799	Rapid testing in delivery room in Aracaju	Brazil
TW005799	Sexual violence and STD and pregnancy prevention in Porto Alegre, RS	Brazil
TW005799	Association between oncogenic HPV and anal lesions in HIV seropositive men	Brazil
TW005799	Prenatal quality assessment of HIV seropositive mothers at a public maternity hospital in Porto Alegre, Brazil	Brazil
TW005799	The use of teledermatology as a support tool in health care of STI patients from a state prison in Porto Alegre, RS	Brazil
TW005799	Mycoplasma genitalis in men with urethritis in Sao Paulo	Brazil
TW005799	Effectivity of the protocol for prophylaxis of vertical transmission of HIV in a maternity hospital in Rio de Janeiro	Brazil
TW005799	Assessment of professional role in STD surveillance reports at Fortaleza	Brazil
TW005799	Risk factors for HBV infection in adolescents in Goiania, Goias	Brazil
TW005799	Patient flow, user necessities and expectations of a STD public health clinic in Porto Alegre, RS	Brazil
TW005805	Research instrument development and validation	Vietnam
TW005805	The mental health functioning of Hanoi street children	Vietnam
TW005805	The mental health functioning of Bien Hoa street children	Vietnam
TW005805	Cultural adaptations of cognitive-behavioral therapy for anxiety	Vietnam
TW005805	School-based models of mental health intervention	Vietnam

Award Number	Project Title	Project country
TW005805	Social and familial correlates of substance abuse in Hanoi	Vietnam
TW005805	Social and familial correlates of substance abuse in Danang	Vietnam
TW005805	Mental health problems in HCMC High School Students	Vietnam
TW005807	Effects of internal displacement and resettlement on the mental health of turkish children and adolescents	Turkey
TW005807	Peer education model trial for tobacco prevention and control among a group of late adolescents	Turkey
TW005807	Neurocognitive and behavioral characteristics of high risk offspring of parents with schizophrenia, children with ADHD, and normal controls	Turkey
TW005807	Mental health in orphanages: Sanliura sample	Turkey
TW005807	Sexual and reproductive health of adolescents/young people at universities in Turkey	Turkey
TW005807	Predictors of psychological disorders in children after the 1999 massive earthquake in Bolu-Dozce Turkey: Effects of parental mental health on children	Turkey
TW005807	Epidemiological study of mental disorders in adolescents in the aftermath of the Izmit earthquakes	Turkey
TW005807	Mental health problems among children in foster family care system: an Ankara sample	Turkey
TW005807	Mental health in orphans in Turkey: An epidemiologic study of risks, challenges, hope, and meaning	Turkey
TW005807	Development of a cooperative learning approach to assessment of learning among medical students: a Turkish experience in mental health	Turkey
TW005807	Five year follow up epidemiological study of mental disorders in Izmit Province in aftermath of 1999 earthquakes	Turkey
TW005807	Autism spectrum disorder: Neurophysiological correlates	Turkey
TW005807	The HACETTele Project: Telemedicine—Psychiatric research training in Turkey	Turkey
TW005807	Proton magnetic resonance spectroscopy in Asperger syndrome: correlations with neuropsychological test scores	Turkey
TW005807	The world mental health surveys country: 30 Countries, Turkey components	Turkey
TW005807	Cooperative learning in mental health education	Turkey

Award Number	Project Title	Project country
TW005807	Predictors of somatization among adolescents in Turkey: individual and family characteristics	Turkey
TW005807	ADHD, Bipolar disorder, and OCD in adults: a comparative study	Turkey
TW005807	A preliminary study of psychiatric symptoms prevalence in school-aged children	Turkey
TW005807	Prefrontal hemodynamics during continuous performance test measured with near-infrared spectroscopy in adult ADHD	Turkey
TW005807	Magnetic spectroscopy imaging of schizophrenia and Asperger Disorder cases: relation with executive functioning and theory of mind	Turkey
TW005807	Executive functions and attention in children with ADHD and siblings and effects of methyphenidate on these functions	Turkey
TW005807	Continuing research education	Turkey
TW005807	Early indicators of autism-- a prospective screening study	Turkey
TW005807	Behavioral and emotional problems of Turkish children at ages 2-3	Turkey
TW005807	Psychological effects of Marmara earthquakes among Turkish school children after 6 years: a follow-up study of a school sample	Turkey
TW005807	Magnetic resonance spectroscopy in first degree relatives of schizophrenia and patients with ADHD	Turkey
TW005808	Gender, Violence and HIV/AIDS prevention: Behavior Change interventions for church couples in Pietermaritzburg, South Africa	South Africa
TW005808	Process Evaluation of the Young Women's Skills Training Project, Kajado, Kenya	Kenya
TW005808	Religious Responses to the HIV/AIDS Pandemic: Comparative Case Study of Seven Religious Institutions in Prevention/Care in Cross River State, Nigeria	Nigeria
TW005808	The Influence of Traditional Beliefs About Sexuality on the Spread of HIV/AIDS in Africa: A CaseStudy Among the Bantu of Western Kenya	Kenya
TW005808	The Catholic Church's responses to HIV/AIDS prevention and care in Hoima Diocese of Uganda	Uganda
TW005808	"HIV/AIDS Stigma: A Comparative Study of Prevention and Care Interventions in the Catholic and Quaker Churches in Nairobi,Kenya	Kenya
TW005809	Research on developing training program of dynamic oriented psychotherapy and its application in patient	China

Award Number	Project Title	Project country
	with anxiety disorder	
TW005809	Polymorphism and expression of hsp70 in depression	China
TW005809	Gender, job loss, and mental health: a cohort study of middle-aged women in Shanghai	China
TW005809	HIV/AIDS-related stigma in Yi ethnic minority in China	China
TW005809	Development of a feasible FMRI object-naming paradigm	USA
TW005809	Dementia care giving and care seeking experience in Chinese culture	China
TW005809	A primary care intervention trial to improve the quality and outcome of care for depression: a pilot study	China
TW005809	Pilot study of onset of schizophrenia in Hong Kong	Hong Kong
TW005809	Integration of social support into hospital-based mental health service in Beijing: a pilot study	China
TW005809	Assessment of family burdens, needs, and resources as caregivers of patients with schizophrenia	Indonesia
TW005809	Health-seeking behavior of first episode psychotic adolescents and their caregivers in Shanghai	China
TW005809	An ethno-epidemiology study of psychiatric morbidity among infertile Chinese women in Hong Kong	Hong Kong
TW005810	"Evaluating the regional plan for mental health in Michalovce, Slovakia"	Slovack Republic
TW005810	"Epidemiology of mental health in the Slovak Republic: Analysis of data on treated disorders from 1980-2004	Slovack Republic
TW005810	comparative study of pregnancy outcome and patterns of first-year survival in a cohort of newborns from the Czech Republic and California.	Czech Republic
TW005810	Expenditures of Health and Sickness Insurance on Mental Health in the Czech Republic	Czech Republic
TW005810	trends in prevalence of aggressive behavior among schizophrenic patients in Prague	Czech Republic
TW005810	prevalence and characteristics of violent behavior in psychiatric inpatients	Czech Republic
TW005810	Prague Schizophrenia Psycho-education Outcomes Study (PSPOS)	Czech Republic
TW005810	community based delivery of physical activities in the elderly	Czech Republic
TW005810	structure and value preferences of seniors	Czech Republic

Award Number	Project Title	Project country
TW005810	methods of policy analysis, and the determinants and policy implications of school climate in vocational schools	Czech Republic
TW005810	impact of regulation on the supply of ambulatory services in the Czech Republic	Czech Republic
TW005811	Administration of temperment and character inventory in patients with functional psychotic disorders and their first-degree relatives as well as normal controls	India
TW005811	Targeted risk reduction in children of alcoholics	India
TW005811	Prospective double blind randomized comparison study of improvement in negative symptoms of risperidone vs risperidone + citalopram combination therapy in schizophrenia: a clinical study	India
TW005811	A prospective, three year longitudinal study of symptom dimensions underlying the major psychoses	India
TW005811	Statistical methods for mapping multivariate phenotypes	India
TW005811	Molecular genetics and endophenotypes in psychoses--connecting genes, brain, and behavior	India
TW005811	Stigma experienced by the relatives of patients with schizophrenia, bipolar affective disorder, and depressive disorder	India
TW005814	Religious affiliation and depression among people aged 15-59 years old in Hong Kong	China
TW005814	Prevalence study: relationship between suicidal behavior and depressed mood	Hong Kong
TW005814	A long term prospective follow up study of suicide among persons with affective disorders in a Chinese rural area	China
TW005814	Suicidal behavior in persons with schizophrenia in China	China
TW005814	Hong Kong prevelance study of suicidal behavior and related factors	Hong Kong
TW005814	Follow up study of the Hong Kong prevalence study of suicide and behavioral factors	Hong Kong
TW005814	Comparison study of the risk factors of completed suicide between Hong Kong and Singapore	Hong Kong and Singapore
TW005814	Suicide in non-elder populations in Hong Kong: a psychological autopsy study	Hong Kong and Singapore
TW005814	Health living survey: baseline and follow up surveys	Hong Kong and Singapore
TW005814	Health in mind	Hong Kong

Award Number	Project Title	Project country
		and Singapore
TW005814	Evaluation study of the effectiveness of mental health promotion through internet website in workplace setting	Hong Kong and Singapore
TW005814	Suicidal ideation among the aged-home residents in Shenzen City, PRC	China
TW005814	The prevelance and associated factors of suicide ideation, life satisfaction and quality of life of young rural chinese residents in Sichuan, China	China
TW005814	Evaluation of the elderly suicide prevention program and life clinic of NT East cluster of Hong Kong	Hong Kong and Singapore
TW005814	Cerebrovascular risk factors and late life suicide	Hong Kong and Singapore
TW005815	Predictors of HIV and HCV status in IDUs in Vinnytsya, Ukraine	Ukraine
TW005815	Evaluation of school-based HIV/AIDS educational intervention in Vinnytsya, Ukraine	Ukraine
TW005815	Hospital versus outpatient alcohol abuse treatment	Ukraine
TW005815	Feasibility of antiretroviral therapy in Vinnytsya, Ukraine	Ukraine
TW005815	Treatment matching and transport to Ukraine: The Addiction Treatment Agreement Scale	Ukraine
TW005816	Psychological aspects and diabetes, hypertension and Coronary Artery Disease	India
TW005816	Prevalence and risk factors of nephropathy and retinopathy in CURES	India
TW005816	Evaluation of effect of Fenofibrate and Atorvostatin on oxidized LDL in Type 2 diabetic subjects	India
TW005816	Normal distribution ofHbAlc in CURES; Correlation ofHbAlc with CVD risk factors	India
TW005816	Correlation of fasting blood sugar with 2 hour post glucose blood sugar and comparison of ADA and WHO criteria for diabetes in South Indian	India
TW005816	Nutritional Profile of the Metabolic Syndrome of the South Asian Indian Sub Population	India
TW005816	Platelet Activation in Subjects with Glucose Intolerance	India
TW005816	Effect of Hyperglycemia and Advanced Glycation Endproducts on Endothelial Cell Proliferation	India

Award Number	Project Title	Project country
TW005817	Study of Demand on Community Health Care for the Elderly in the Urban of Western Regions of China	China
TW005817	Feasibility study for establishing the multi-tier elderly healthcare system	China
TW005817	Study on health aging-based community health services demands in urban and rural areas of China	China
TW005817	Factors of healthcare utilization for the elderly in urban Beijing	China
TW005818	Brief intervention for alcohol problems among older patients in Polish general hospitals	Poland
TW005818	Trends in adolescent substance use and selected indicators of psychosocial wellbeing	Poland
TW005818	Characterization of cocaine esterase: stability study	USA
TW005818	Searching for treatment decision rules in major depressive disorder	USA
TW005818	Addiction Curriculum development for Physicians	Poland
TW005818	Mood, Genetics, and treatment outcomes for alcohol problems	Poland
TW005818	Sleep disturbance in alcohol dependent patient – influence of gender	USA
TW005818	HPA Axis activation and course of substance abuse disorders	USA
TW005818	The Warsaw adolescent study on resiliency: a development project	Poland
TW005818	HPA Axis correlations with family history of alcohol dependence and risk of relapse among alcohol dependent patients	USA
TW005818	Study on an alternative to searching for predictors and interactions in clinical datasets	USA
TW005819	Electronic collaboratory for investigations about drugs at Universidade Privada de Valle	Bolivia
TW005819	Validation of instruments and comparison of patterns of psychoactive substance use during adolescence for a multicentered application of the Portland Prevention Trial	Peru

Appendix G: Operational Definition Used to Classify ICOHRTA Projects as 'Implementation Science'

General Definition: Implementation Science is the scientific study of methods to promote the integration of research findings and evidence-based interventions into healthcare policy and practice. It seeks to understand the behavior of healthcare professionals and support staff, healthcare organizations, healthcare consumers, and policy-makers *in context* as key variables in the sustainable uptake, adoption, and implementation of evidence-based interventions.

Synonyms: Type 2 Translation

Partially Overlapping Fields: Health Services Research; Public Health Evaluation; Operations Research; Phase IV Clinical Trials; Diffusion/Dissemination Research; Delivery Science

Operational Definition: Research classified as 'implementation' must fall into at least one of the following categories of qualifying study/activity types:

Pre-Implementation Research. Research to identify and characterize social, economic, and behavioral determinants of implementation of evidence-based interventions/strategies – including factors that influence access to and utilization of evidence-based interventions. This includes descriptive/observational studies that:

- Assess the **appropriateness or feasibility** of specific evidence-based interventions/strategies in particular geographic or cultural contexts; OR
- Assess **actual or potential barriers** to implementation of particular interventions/strategies in particular contexts; OR
- Explore **structural/behavioral characteristics of communities and health system** in the context of particular implementation challenges.

Notes: Efforts to validate research or clinical tools (e.g. a stigma scale) or specific technologies (e.g. drugs, medical devices) do not qualify unless a specific implementation strategy for using the tool or technology is also being examined. Studies using approaches from medical sociology or anthropology may qualify, but the central research question must be linked directly to an actual or hypothetical implementation challenge.

Implementation Model, Pilot, Case Study, or Systematic Review. **Development** of strategies/methods/tools for promoting access to these interventions. This includes studies that:

- Develop **models** to predict changes to the health system or to public health associated with different implementation strategies; OR
- **Pilot test** a novel intervention/strategy in the field or **adapt** an existing implementation strategy to a novel context and examine resulting changes in implementation processes and outcomes; OR

- Determine **best practices for implementation** from systematic review or meta-analysis of multiple implementation experiences.

Notes: Studies of this type may include some empirical data on apparent outcomes/impacts, but focus will be on describing and analyzing the implementation experience, process, requirements, scalability, etc.

Evaluation research (process and impact evaluation). **Testing** the outcome or impact of evidence-based interventions using:

Process Evaluation: Evaluative studies that focus on the **process by which particular strategies have been implemented** rather than the outcomes/impacts. Focus may be on whether necessary conditions were met, whether the strategy was implemented as intended, ways to refine or streamline the process, long-term sustainability, etc.

Impact Evaluation. Experimental, quasi-experimental, longitudinal, or cross-sectional studies that aim to:

- Evaluate the **outcome/impact** of evidence-based interventions/strategies in **particular cultural/geographic contexts (context-dependent);** OR
- Evaluate the outcome/impact of evidence-based interventions/strategies relative to **variables with general relevance** such as basic human behavior **(context-independent)**.

Notes: Key research challenges are to define appropriate outcome measures and account for potential confounders to cause-effect relationship in 'real world' settings.

Tools for improving the field of implementation research through (Theory and Practice). Studies or activities aiming to improve the theory and/or practice of implementation research by:

- Proposing, critiquing, and refining **theoretical models** of implementation processes; OR
- Developing and validating **measures** for key implementation outcomes; OR
- Developing or adapting from other fields **research methods**, **training materials,** and/or **other tools** from other fields to facilitate the further development of implementation research as a field of science.

Notes: Activities in this category are not research studies per se but rather aim to further develop 'implementation science' as a field of inquiry. Qualifying activities must be exclusively focused on processes and challenges related to implementation science.

Appendix H: ICOHRTA Publications

Award	Publication
TW005795	Des Jarlais DC, Johnston P, Friedmann P, Kling R, Liu W, Ngu D, Chen Y, Hoang TV, Donghua M, Van LK, Tung ND, Binh KT, Hammett TM. Pattenrs of HIV prevalence among injecting drug users in the cross-border area of Lang Son Province, Vietnam, and Ning Ming County, Guangxi Province, China. BMC Public Hlth 5:89, 2005.
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