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I-Med Exchange Evaluation

The GFATM: Which countries owe, and how much?

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COVER STORY

I-Med Exchange Evaluation

The International Association of Physicians in AIDS Care (IAPAC) launched in July 2000 a pilot initiative to demonstrate whether information technology could provide much-needed support to HIV/AIDS care providers in five southern African countries. This internal evaluation of I-Med Exchange examines the objectives, implementation challenges, and current status of IAPAC's pilot initiative.

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The GFATM: Which countries owe, and how much?

Tim France, Gorik Ooms, and Bernard Rivers

As the Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM) prepares to award sizable grants throughout the developing world, many wonder whether there is enough money in the pot to accommodate burgeoning needs. Have affluent countries contributed enough toward the GFATM?

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battling complacency
advancing commitment

INTERNATIONAL ASSOCIATION OF PHYSICIANS IN AIDS CARE
Headquarters Office
Chicago, Illinois, USA

PRESIDENT/CEO José M. Zuniga
SR VICE PRESIDENT/COS Michael S. Glass
CONTROLLER Harry J. Snyder

INTERNATIONAL ASSOCIATION OF PHYSICIANS IN AIDS CARE
Southern Africa Regional Office
Johannesburg, South Africa

EXECUTIVE DIRECTOR Shaun Conway
DEPUTY DIRECTOR Mulamba Diese

IAPAC MONTHLY

EDITOR-IN-CHIEF José M. Zuniga
MANAGING EDITOR Lisa McKamy
CREATIVE/DESIGN DIRECTOR Holly J. Emanuelson
ADVERTISING/MARKETING DIRECTOR Lori Gertz
WRITER-AT-LARGE Mark Mascolini
CONTRIBUTING WRITERS Lisa Keen, Dave MacDougall, Bob Roehr

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IAPAC

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REPORT FROM THE PRESIDENT

Full partners in the struggle

José M. Zuniga

Each month, as I put pen to paper and draft my message to members and allies of the International Association of Physicians in AIDS Care (IAPAC), I am filled with mixed feelings of concern and hope. Needless to say, it is at these moments of quiet reflection that the success of our efforts, as well as general developments in the struggle against the HIV/AIDS pandemic are most fully measured in my mind. Doubtless, these conflicting sentiments are shared by each of us who is seriously committed to and engaged in this struggle.

Our personal introspection and the sheer magnitude of death and suffering that we witness continue to drive us to act swiftly. Foremost, we must congratulate ourselves for the passion and compassion that we have been able to harness in this respect. Yet, I would also suggest that where we are intent on making a truly deep impact through our energies, it is equally important that we take time to step back from our work in order to gain full sight of the landscape as it stands before us. We must take count not only of *what* is being done, but also *how* and *by whom*.

When we look at the AIDS pandemic at this moment in time, we should remark that incredible strides have been made in the clinical management of HIV disease. However, what is equally evident is that HIV/AIDS remains a global plague that disproportionately affects countries and populations in resource-limited settings. Moreover, glaring disparities continue to be exhibited, the world over, when we look at some of the ways in which race, class, and gender intercede in the general prevalence of HIV disease. Paradoxically, we see at the same time that not only funding, but also policy and programmatic decision-making, continue to flow primarily from the rich, industrialized countries of the North, to the poorer and often beleaguered nations of the South. Thus, when we ask not simply *what* is being done, but also *how* and *by whom*, it is clear that many voices that need to be heard remain at the periphery of our collective struggle.

Though these facts are in plain sight, I fear that they continue to receive an inadequate amount of our attention and consideration. I am not suggesting that we are blind to this paradox, but that it is all too often accepted, if grudgingly, as simply the unfortunate reality of the day. This is something for which we share collective responsibility and something that we must resolve, together, to change.

While IAPAC is not above some criticism for the limited vehicles through which the association's core programming activity has, in the past, been determined, I am incredibly pleased to announce some recent and important changes in this regard. That is to say that, over the past months, IAPAC has taken some very significant steps to ensure that commitment to fulfilling our mission is driven by a truly international perspective; one which strives to incorporate resource-limited countries and the populations most affected by the pandemic, as full partners in the struggle.

I report with great pleasure that in April 2002, the IAPAC Board of Trustees elected three individuals of very high global esteem and integrity. IAPAC's three new Trustees are Elly Katabira, Associate Dean of the Makerere University Medical School in Kampala, Uganda; Celso Ramos-Filho, Associate Professor in the Department of Preventative Medicine at the Federal University of Rio de Janeiro's School of Medicine in Brazil; and Rubin Phillip, Bishop of the Diocese of Natal-Coastal Area within the Anglican Church

Continued on page 135

Elly Katabira

Celso Ramos-Filho

Rubin Phillip

of the Province of Southern Africa in KwaZulu-Natal, South Africa.

Collectively, these three longtime allies bring to IAPAC an impressive track record in the clinical management of HIV/AIDS and/or human rights advocacy. Both individually and in combination, their international experience and in-depth knowledge of the obstacles faced at both country and regional levels will greatly enhance the international scope of the association's activities and the appropriateness and integrity of our program lines.

Ramos-Filho, who serves on the Editorial Advisory Board of *JIAPAC*, IAPAC's quarterly peer-review journal, was an instrumental organizing committee member for the first four IAPAC-sponsored International Conferences on Healthcare Resource Allocation for HIV/AIDS, and served as Chair of the fifth such conference, which took place last month in his native city. In this capacity, and in addition to his full-time teaching and research post at the Federal University of Rio de Janeiro, Ramos-Filho has been a key figure in the call for increased funding for the battle against HIV/AIDS in the developing world. Furthermore, he has been a significant contributor to the public policy discussions that underlie his country's exemplary success in both curbing their national epidemic and establishing quality AIDS care delivery mechanisms for HIV-infected Brazilian men, women, and children.

Katabira, who counts on a much-deserved reputation as a leading figure in HIV clinical and public health management, both on the African continent and abroad, is former Director of the World Health Organization (WHO) Africa Region Office (AFRO), located in Harare, Zimbabwe. Since 2001, he has served as Co-Chair of IAPAC's Global AIDS Learning & Evaluation Network (GALEN). His keen and broad knowledge not only of medical practice, but also of the obstacles and challenges to public healthcare provision on the African continent, has been an invaluable addition to the sum of voices advancing the GALEN agenda. His voice will now help guide the advancement of IAPAC's global mission.

Phillip is a prominent example not only of the moral and ethical guidance that must be central to IAPAC's activities, but also of the diversity of callings and experience that must drive public health efforts. In both his ecumenical work and civil rights advocacy in South Africa, Phillip has demonstrated a powerful determination to speak truth to power, standing up to the human rights abuses of the South African apartheid government during the heights of its cruelty. Yet, his work on behalf of his people continues through to this day, and Phillip remains active in addressing the HIV/AIDS epidemic in southern Africa, with special attention to human rights surrounding access to treatment.

Also soon to join the IAPAC Board of Trustees is longtime member Praphan Phanuphak, who is Director of the Thai Red Cross Society HIV/AIDS Research Centre in Bangkok. Phanuphak is a prominent clinician and researcher who has been on the frontlines of combating the HIV/AIDS epidemic in Thailand. He has served on the Organizing Committee of the past five IAPAC International Conferences on Healthcare Resource Allocation for HIV/AIDS, and is a member of the *JIAPAC* Editorial Advisory Board. Phanuphak's appointment to the IAPAC Board of Trustees will take place in late May 2002.

In addition to these valuable additions to the IAPAC Board of Trustees, I am pleased to announce the appointment of a new interim Executive Director for IAPAC's Southern Africa Regional Office (SARO), located in Johannesburg, South Africa. Effective May 2002, Mulamba Diese, a practicing physician, will assume this position. Originally from the Democratic Republic of Congo, he has been a leading figure in the clinical management of HIV/AIDS on the African continent for almost 20 years.

Diese has resided in Johannesburg for 11 years, where he has both practiced clinical medicine and, more recently, served as IAPAC-SARO's Deputy Director. He is now charged with the critical responsibility of ensuring that IAPAC's mandate of providing physician support and advocating for equitable and appropriate access to HIV care and support services, is carried forth in the world's most HIV-affected region. Diese's appointment as interim Executive Director will soon be followed by an intensive, international search for a permanent Executive Director.

With the addition of these colleagues to the various ranks of IAPAC's leadership structure, an extremely high level of clinical and public health expertise is being brought to the decision-making table. What is of even greater significance, however, is the

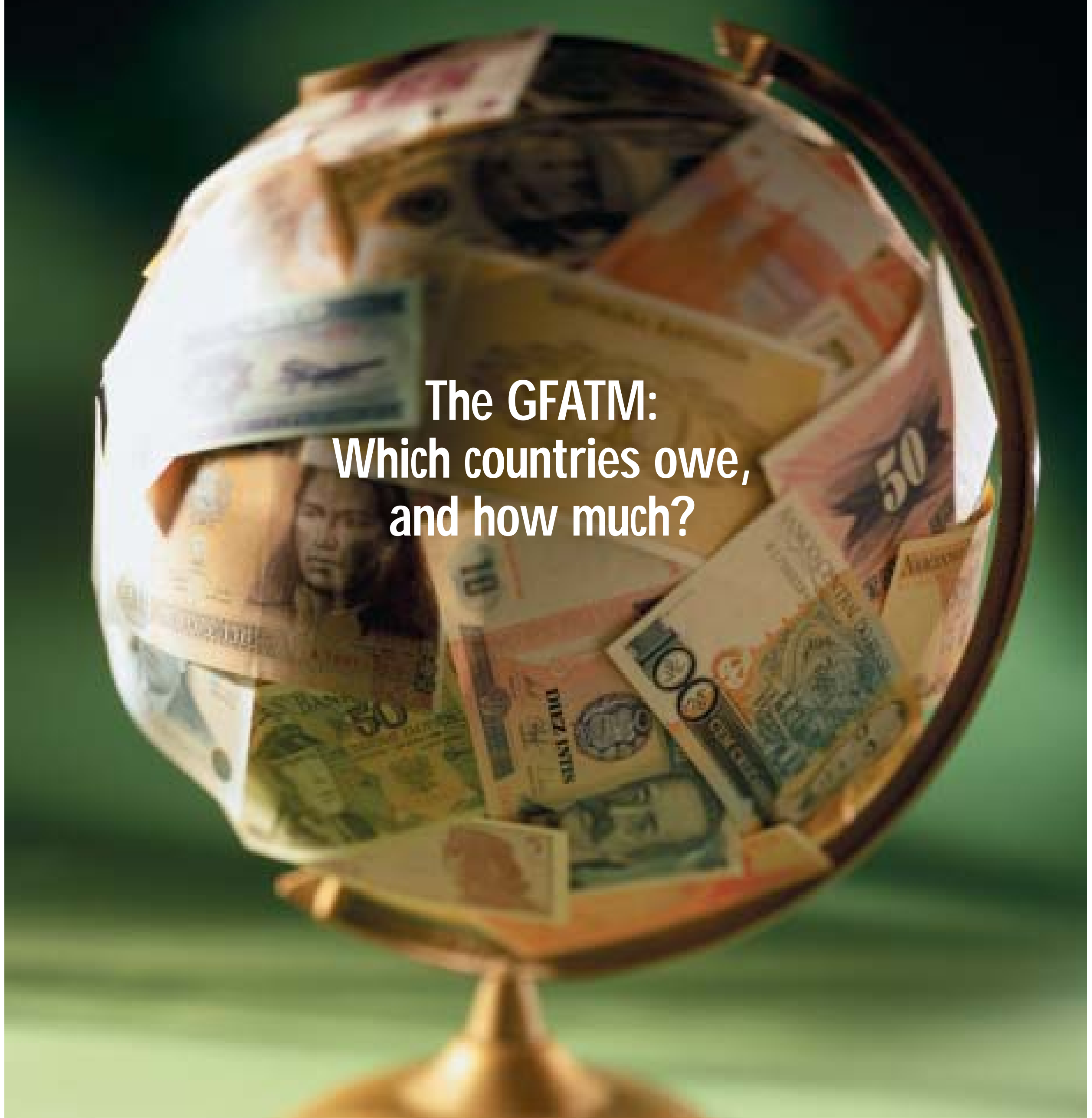
Praphan Phanuphak

Mulamba Diese

invaluable contribution of practical and culturally diverse experience that our new IAPAC Board of Trustees and staff members will provide, in ultimately ensuring that the delivery of services and care within resource-limited settings effectively reaches men, women, and children in greatest need.

IAPAC does not rest satisfied with these important appointments. Nonetheless, they signify a strengthened commitment to providing a comprehensive and fully inclusive response to the global HIV/AIDS pandemic. This marks but the beginning of what I am confident is a new and very promising chapter in the history of our association. A heartfelt welcome and message of congratulations goes out to each of IAPAC's new Trustee and staff appointees. May their strength and leadership help to guide us as we battle complacency and advance commitment in our struggle against the HIV/AIDS pandemic. ■

José M. Zuniga is President of the International Association of Physicians in AIDS Care and Editor-in-Chief of the IAPAC Monthly.



The GFATM: Which countries owe, and how much?

Tim France, Gorik Ooms, and Bernard Rivers

Nearly one year ago, the majority of the world's nations resolved at the United Nations General Assembly Special Session on HIV/AIDS [June 25-27, 2001] to increase annual expenditure on the AIDS epidemic to US$7-10 billion by 2005, with much of this money to be raised and disbursed by a new global fund. When the fund was eventually set up, its mandate was extended, and it was named the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM).

AIDS, an unprecedented and accelerating emergency, is already having a devastating impact in Africa, with similar impacts unfolding on other continents. Every day, 8,000 die, and 13,000 more become infected. Experts agree that reasonable expenditures on prevention and treatment of AIDS, tuberculosis and malaria can be of dramatic benefit not only to human health, but also to economic development.

Thus far, efforts have been made to raise the money needed by the GFATM through ad hoc voluntary donations. These efforts have failed. [As of May 2002,] governments have pledged a mere US$1.8 billion. Contributions from the private sector have been even more disappointing, with not a single meaningful pledge since the Bill & Melinda Gates Foundation offered US$100 million [more than] 10 months ago.

It is time for a new approach. The GFATM needs to grow rapidly to the point where it raises US$10 billion a year. Contributions to the GFATM should be equitably shared among the countries whose citizens live the most comfortable and unthreatened lives. This means that the wealthiest countries, such as the United States, should contribute considerably more than they currently do. But it also means that contributions should come from the likes of Australia, Singapore, and the United Arab Emirates—relatively wealthy countries that have not yet contributed a penny.

Part of the problem is that to date, nobody has proposed which countries should give how much. Table 1 thus offers an "Equitable Contributions Framework" that can be used as a starting point for working out an appropriate contribution level for each country, and for measuring how well each country is doing against that level.

The Equitable Contributions Framework

Continued on page 141

Table 1. **"Equitable Contributions Framework" for the GFATM based on GDP (April 2002)**

Country	*Suggested "equitable annual contribution" to GFATM (US$million), proportionate to GDP*	*Total pledge thus far to GFATM (US$million, and as % of column 2)*		*Estimated portion of total pledge that applies to 2002 (US$million, and as % of column 2)*	
G7 "high Human Development Index" countries:					
United States	3,479	450	(13%)	250	(7%)
Japan	1,646	200	(12%)	68	(4%)
Germany*	658	158	(24%)	35	(5%)
United Kingdom*	498	219	(44%)	67	(13%)
France*	453	151	(33%)	51	(11%)
Italy*	376	215	(57%)	73	(19%)
Canada	243	100	(41%)	38	(15%)
Total for G7 countries:	*7,352*	*1,493*	*580*		
Non-G7 countries:					
Spain*	195	58	(29%)	19	(10%)
Netherlands*	128	125	(97%)	42	(32%)
Switzerland	85	10	(12%)	3	(4%)
Belgium*	81	19	(24%)	6	(8%)
Sweden*	80	58	(73%)	20	(25%)
Austria*	67	4	(5%)	1	(2%)
Denmark*	57	2	(4%)	1	(1%)
Finland*	42	2	(4%)	1	(1%)
Greece*	39	2	(4%)	1	(1%)
Portugal*	37	1	(4%)	0	(1%)
Ireland*	33	10	(31%)	3	(10%)
Kuwait	10	1	(10%)	0	(3%)
Luxembourg*	7	3	(41%)	1	(14%)
Argentina, Australia, Bahamas, Bahrain, Barbados, Brunei, Chile, Costa Rica, Croatia, Cyprus, Czech Republic, Estonia, Hong Kong,Hungary, Iceland, Israel, Lithuania, Malta, New Zealand, Norway, Poland, Qatar, Singapore, Slovakia, Slovenia, South Korea, United Arab Emirates, Uruguay	1 to 161	0	(0%)	0	(0%)
Total for non-G7 "high HDI" countries:	*1,648*	*294*		*99*	
TOTALS:					
Total for all 48 "high HDI" countries:	**9,000**	**1,788**		**679**	
Total for all other countries**	**0**	**33**		**11**	
Total for private sector (foundations and corporations)***	**1,000**	**101**		**34**	
Grand total:	**10,000**	**1,922**		**725**	

Explanatory example: The GDP in 2000 of all 48 countries totalled US$25,569 billion. The GDP of the United States that year was US$9,882 billion, or 38.7 percent of the total. Thus, if the 48 countries shared equitably the donation of US$9 billion annually to the GFATM (with the remaining US$1 billion coming from the private sector), the US contribution would be the US$3.479 billion that is shown in Table 1.

Authors' note: The final column in Table 1 is based on private sources plus our own estimates, because the information is not published. We understand that total pledges are as follows: for 2002 US$725 million; for 2003 US$487 million; for 2004 US$132 million; for 2005 US$67 million; for 2006 US$27 million. [These totals are supplemented by an additional] US$484 million for which the year(s) are not specified. We also understand that the pledges for 2002 (before adding shares of the European Union pledge, when appropriate) include United States US$250 million; United Kingdom US$60 million; The Netherlands US$40 million; Canada US$37.5 million; and Germany US$26.5 million. For other countries and for the private sector, the 2002 portion is not known, so we have assumed it to be 33.8 percent of the total pledge, in order to bring the overall 2002 total to the known figure of US$725 million.

*The European Commission has pledged US$106.9 million to the GFATM. In Table 1, this sum has been added to the direct pledges to the GFATM of the 15 European Union countries, in proportion to their respective GDPs. Denmark, Portugal, Finland, and Greece have not made any direct pledges, but, like the others, have been credited here with portions of the European Commission pledge.

** Eight non-"high HDI" countries have pledged funding to the GFATM. These countries are Russia (US$20 million); Nigeria (US$10 million); Uganda (US$2 million); Zimbabwe (US$1 million); Andorra (US$100,000); Niger (US$50,000); Liberia (US$25,000); and Kenya (US$8,273).

*** Of the US$101.15 million pledged by the private sector as of April 18, 2002, US$100 million was pledged by the Bill & Melinda Gates Foundation.

suggests that US$1 billion a year should come from the private sector, as a minimum to justify the label "public/private partnership" and the two seats it has out of the 18 voting seats on the GFATM board. The remaining US$9 billion a year should come, in proportion to Gross Domestic Product (GDP), from the 48 countries that have a "high" Human Development Index (HDI)—the United Nations' HDI measures the overall quality of life based on standard of living, life expectancy, and literacy rates plus school enrollment.

The proposed contribution comes to 0.035 percent of GDP for each country. Not one country has yet given at this level. Assuming, in the absence of better data, that every contribution made thus far is entirely for use this year, The Netherlands (contributing at 97 percent of its proposed level), Sweden (73 percent) and Italy (57 percent) have done reasonably well. Seventeen countries have given between 1 percent and 50 percent of the proposed level, with Japan and the United States at a very disappointing 12 percent and 13 percent, respectively. And 28 "high development" countries have given nothing at all.

It is to the credit of countries such as Uganda and Nigeria that, poor as they are on a per capita basis, they have made multi-million-dollar contributions to the GFATM. And it is to the shame of many of the 48 relatively wealthy countries that they have contributed little or nothing, without even stating why.

The GFATM represents a bold new approach. Its leaders say that it will be more fast moving, participatory, transparent, and accountable than traditional channels. The GFATM needs a chance to prove itself. What a shame if [the GFATM] were to fail simply because it did not receive the funding needed to get properly established and to respond to the most urgent and obvious needs. ■

Tim France is Director of Health & Development Networks, an Irish nonprofit organization based in northern Thailand that works to improve communication in HIV/AIDS and other health fields. Gorik Ooms is Head of Mission of Médecins Sans Frontières-Luxembourg's operations in Mozambique. Bernard Rivers is head of Aidspan, a New York-based nongovernmental organization providing fundraising assistance to developing country AIDS projects.

I-MeD EXCHANGE

BRIDGING THE DIGITAL DIVIDE

Patrick Connelly

Secure the Future (STF), a US$100 million philanthropic initiative of Bristol-Myers Squibb, was launched in May 1999 with a goal of funding innovative HIV care, prevention, and research programs to benefit women and children living with and affected by HIV disease in five southern Africa countries. Within a year, STF funded a number of institutions, including the International Association of Physicians in AIDS Care (IAPAC) to launch a series of innovative programs, among them I-Med Exchange. This pilot IAPAC program aimed to determine whether information technology could provide a means for bringing HIV/AIDS health education and information support to remotely located physicians and allied health professionals working in STF-targeted countries.

In announcing a US$390,000 grant to IAPAC, Bristol-Myers Squibb Vice Chairman Kenneth Weg classified I-Med Exchange as "a pioneering step in dramatically expanding access to knowledge for the care and support of HIV/AIDS patients in sub-Saharan Africa. This model initiative is an opportunity to bring the benefits of modern medicine and technology to the people of the developing world to improve public health…"

With STF funding, and a subsequent donation of 100 multimedia computers by Compaq Corporation, IAPAC announced I-Med Exchange's launch in July 2000 at the 13th International AIDS Conference in Durban, South Africa. The one-year pilot program would be directed to physicians and allied health professionals providing HIV/AIDS care in five southern African countries—Botswana, Lesotho, Namibia, South Africa, and Swaziland—each of which was selected because of high HIV prevalence and desperate need for human resource and infrastructure development. In scope and design, I-Med Exchange was to be a pioneering initiative to bring connectivity, remote support, and HIV/AIDS education and information via the Internet to healthcare workers across the five-country region.

Almost two years now to the date since its launch, I-Med Exchange has provided a critical mix of benefits and lessons. These will not only be filtered into the ongoing refinement of the program, but also form the veritable genesis of knowledge surrounding appropriate means of introducing advanced information technologies into limited-resource settings on the African continent, and elsewhere, for the purpose of enhancing medical education and knowledge sharing. It is in this spirit of learning, growing, and facing the future in full partnership with our colleagues worldwide, that IAPAC shares its experiences, to date, surrounding I-Med Exchange.

I-Med Exchange objectives

I-Med Exchange proposed to "bridge the digital divide" between the developing world and the developed world for health information, using information technology. IAPAC posited that by providing education and information on HIV/AIDS, physicians would be empowered with knowledge to confront the epidemic. The program would also facilitate bi-directional dialogue among physicians from the various regions and sites of southern Africa and with HIV/AIDS specialists around the world.

The main, formal activity of physicians enrolled in the program would be to participate in interactive online presentations accessed live on the Internet, or viewed as archived seminars either on an I-Med Exchange Web site or CDROM.

During these live presentations, physicians would be encouraged to share their experiences in treatment and care with leading HIV/AIDS experts, and to collaborate to forge partnerships with their colleagues. With Internet capability, physicians would also be able to access the vast resources of the World Wide Web, and would have a multimedia computer with all necessary software and a printer, to use as a resource in their work.

Breakthrough

The inaugural "virtual seminar" of I-Med Exchange was a significant event. We waited in anticipation, seated in front of a computer screen at IAPAC's Southern Africa Regional Office (Johannesburg), poised with our headsets to "bridge a digital divide." This was an adventure that, by now, had come to feel more and more like navigating a rope bridge across the Limpopo river in a new 4-wheel drive vehicle.

It had already been a long journey to this point, filled with metaphorical "obstacles, potholes and diversions." This made the moment even more tense and memorable, as we sat, counting down the moments to "lift-off."

Finally, and one-by-one, participant names began to appear on the screen, as proof that Francistown was listening, Oudtshoorn had arrived and Tintswalo had tuned in. We waited with baited breath to witness the "birth of a new age," half expecting to hear crackly transistor voices coming to life. Our fascination with the technology that we had finally tamed, and the novelty of this impressive application enthused the session participants as we "sound-checked" again and again to confirm that we were all virtually there.

Along the path, some names disappeared as others appeared. Throughout, some were not to be seen again, while others reappeared after dropping off at certain points. Clearly, this pointed to the fact that some participants were obviously having a difficult time staying connected, as the instability of their "pots" (plain old telephone system) connections let them down.

Nonetheless, we persisted. Participants experimented with the interactive tools on the Centra interface. They intuitively marked "checks" and "crosses" to indicate either "yes/OK" or "no/I have a problem," and raised their virtual hands in order to be passed a microphone icon so that they could make comments in real-time. Surprisingly, and to the pleasure of all, speakers came across as clearly as if they were on a telephone call.

This was so much more functional than a teleconference call, and far more fun! For some. Swept away by our satisfaction that the system appeared to be functioning fairly well, a text message soon appeared from one participant, a senior AIDS physician at a government referral hospital who had logged on from Botswana. Evidently he was not receiving the audio feed and his version of the presentation slides were taking forever to load onto his screen. Yet, more than these technical difficulties, his text message to the group read: "Today I saw a patient who is failing his second antiretroviral regimen ... can you advise what the options are?"

Glee turned to consternation, as reality checked in. This was the poignant reminder of why I-Med Exchange was necessary.

Online curriculum

A multinational Curriculum Committee of well-recognized HIV/AIDS thought-leaders was convened to serve as custodian of the educational aspects of the program and to develop the curriculum outline.

An international faculty of presenters from among IAPAC's worldwide membership base agreed to deliver online seminars based on this curriculum, that included issues from a comprehensive range of HIV/AIDS treatment, care, and support topics.

Environmental survey

One of the stated purposes of I-Med Exchange was to investigate unchartered territory by delivering education to remote areas over the Internet. This pilot program was a way to investigate what implementation challenges need to be addressed if information technology (IT) is to be used as a tool in supporting HIV/AIDS care capacity. Reporting on the lessons learned and problems encountered is an important outcome of the program.

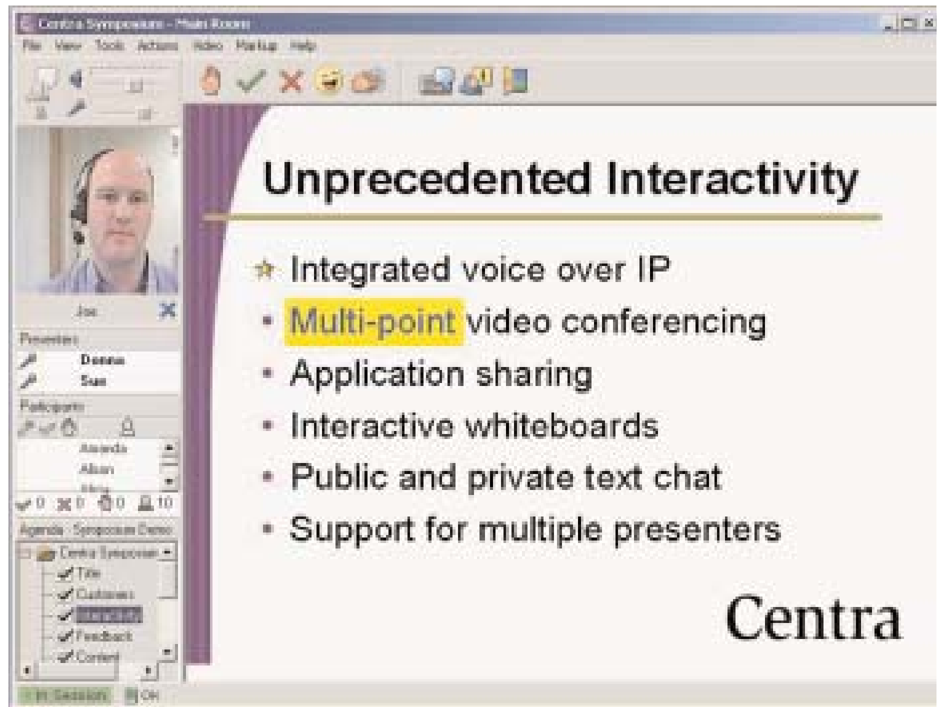
IAPAC conducted a pilot study in a few different settings before proceeding to distribute computers. This was done in order to avoid and correct any problems that might have been encountered. Unfortunately, despite this measure, certain difficulties were only discovered once equipment had already been widely deployed.

Participant selection and allocation of equipment to sites

The first task facing project coordinators was to find ways of sensibly distributing donated computer equipment as equitably as possible across the participating countries, while responding most appropriately to identified instances of need in each.

An objective evaluation tool was developed to rank the needs and appropriateness of individual applicants. Ultimately, their enthusiasm to participate in the program was the most important deciding factor, but other criteria included:

- Numbers of patients likely to benefit
- Rural/geographically remote care site
- Minimum of one physician and two nurses to share resources
- Assessment of currently available resources and self-determined needs and gaps
- Proof that participant would be able to transfer knowledge and skills to other health care workers
- Willingness to be partnered with a colleague mentor
- Endorsement by district/regional/provincial health authority
- Agreement to participate in 12 seminars to qualify for CME (CPD) accreditation



Sophisticated Web-based interaction using a Centra Web-conferencing interface.

In many instances, rank score of need weighed heavily in favor of the applicant being offered equipment to become an I-Med Exchange enrollee. However, this need also reflected the difficulty that could be expected to be encountered in establishing and supporting the IT infrastructure at that site. This subsequently impeded progress since the sites most in need of assistance were found to be least prepared and/or appropriate (from a technical perspective) to receive the donation.

So, while the resulting process did achieve strategic distribution of hardware, this was done without enough consideration for the environment that would be necessary to support the technologies at each chosen site. The deployment process therefore failed to ensure that Internet accessibility could be realistically achieved for all participants, based on their infrastructure and other challenges as described in greater detail, in this report.

On advice from STF, Namibia was eventually excluded as a participating country, since ongoing impediments to STF's involvement there were inhibiting progress in implementing I-Med Exchange. In the remaining countries (Botswana, Lesotho, South Africa, and Swaziland), IAPAC worked in cooperation with Ministry of Health officials (or with the endorsement and knowledge of the ministries) to identify individual physicians who would be most suitable participants.

As of December 2001, 88 out of the total of 100 computers had been allocated to physicians in four southern African countries:

- 26 in Botswana
- Five in Lesotho
- 39 in South Africa (with a further eight allocated, but not yet dispatched)
- 10 in Swaziland

Of the remaining 100 donated computers, four were used in the establishment of IAPAC's Southern Africa Regional Office (SARO) to support the program. Another eight could not be used at all, for technical reasons.

Each country had its own requirements for receiving computers, that had to be taken into consideration, and with different bureaucratic procedures needing to be respected in each situation.

Within South Africa, for example, the computer equipment was allocated to individual recipients who agreed to sign a personal loan arrangement, since the procedures for government departments to officially receive donations into their asset register were prohibitive. This has led to difficulty defining who is responsible for

Table 1. **Distribution of computers and number of active users**

Country	Computers allocated	Allocated active users
South Africa	39	24
Lesotho	5	None
Swaziland	10	10
Botswana	26	18

the equipment upkeep and for liability in cases of loss or damage. Disputes over ownership have also been encountered, complicated by some participants relocating or changing their area of work.

In comparison, the Swaziland government itself received the equipment as an official donation, and so has taken ownership and control over its allocation and usage. Processing this donation through customs procedures from South Africa created long delay in getting the equipment to recipients, since Swaziland's government had to undertake lengthy and complex procedures to obtain exemption from importation duties on the computers. The current distribution of I-Med Exchange sites is summarized in Table1.

Many of the sites at the end of this evaluation period are occupied only by individual participants, but IAPAC has been actively restructuring these sites in order to allocate equipment that has not been used optimally, to more appropriate sites. In this reallocation process, preference is being given to sites where the donation of computer equipment is most likely to contribute toward the development of a "telecenter" that is accessible to many more individuals than the single I-Med Exchange subscriber.

The advantages to this approach are the increased influx of resources into local initiatives to serve as a developmental catalyst, and the strengthening of existing infrastructure. The model has yet to be fully implemented or properly tested, and this will be a priority for the immediate continuation phase of I-Med Exchange.

IAPAC-SARO is currently also establishing a regional information and training resource center in Johannesburg. The resource center will serve as the hub of a linked network of smaller peripheral information and training resource sites, supported through I-Med Exchange. Three sites have already been established at public hospitals, and IAPAC hopes to re-deploy a further eight previously distributed computers in this way.

Technical barriers

The full technical requirements and resources needed for maintaining and supporting such a widely dispersed network of computers installed at isolated low-infrastructure sites, and used by IT-inexperienced health professionals, was entirely underestimated.

To address some of the technical requirements, independent IT consultants were employed in each country to diagnose problems and, to a limited extent, assist with overcoming initial implementation difficulties in the rollout phase of the program.

Some of the technical problems specific to each implementation country

In **Swaziland**, a number of computer problems were experienced due to storm damage, lightning strikes, and power surges. Telephone connections were not adequate for consistent dial-up connectivity and were found to be much slower than in South Africa. For a period of time, connections were even completely severed when the telephone company suspended the government's telephone services over a payment dispute, despite I-Med Exchange sponsoring the costs of the Internet connections. An independent technical audit of connectivity and hardware was commissioned by IAPAC and technology consultants advised replacing all modems as a solution to the poor connectivity.

Participants in **Botswana** also experienced frustratingly slow Internet connections and the modems supplied were not reliable. Even after replacing these modems with alternative external modems, the stability of basic Internet connections improved, but remained inadequate for participants to access real-time online seminars, which a technical expert ascribed to "routing problems" within the Botswana Telecom system.

In **Lesotho**, five computers were donated to the Ministry of Health, but have never been connected to the Internet, due to the absence of a suitable internet service provider (ISP) that could be accessed from government facilities. Internet services have only recently become available but the telephone company can only guarantee a 9,600 bps slow connection. New telephone lines are difficult to have installed and Ntabiseng Mabitle, Director of the National AIDS Program, states, "Communication is a real problem. We have only one fax machine in the whole department and only a few computers." Adding to these difficulties, the modems supplied through Compaq's donation have also been found incompatible with the computer hardware.

South Africa fared much better with connectivity, but was also plagued by incompatible modems installed in the donated computers. Connecting to rural sites was also problematic in this setting.

Assessing computer hardware

Making computer hardware available to selected sites that did not have adequate, pre-existing IT was seen as a necessary incentive and means for achieving participation by physicians in I-Med Exchange.

Compaq Corporation (Compaq) donated 100 multimedia computers to be distributed to these sites. Sadly, this benevolence turned out to be fraught with pitfalls. The computers became a source of much difficulty and frustration, severely impeding the program's implementation. For example, the donated hardware was received from Compaq without CDROM drives (while the Microsoft-based operating system and office utilities were also provided by Compaq on CDROM disks). Internal modems supplied with the computers had also not been installed and costly technical assistance had to be contracted to prepare the computers for distribution. Particularly frustrating, was that these internal modems failed in most of the computers because of their incompatibility with hardware.

This lack of coordination and shifting responsibility for the donated computer equipment frustrated IAPAC's implementation of I-Med Exchange and highlights the importance, for both donor and recipient, of properly managing donation processes. STF facilitated this substantial donation from Compaq. The equipment was shipped from Compaq's French division and facilitated by Compaq South Africa (where CDROM drives and internal modems were added to the PC bundle). When technical difficulties arose, it became impossible to identify who could provide assistance and who was accountable.

After almost a year of dealing with this critical difficulty, a technical memo written by Compaq surfaced, which documented that a known incompatibility exists between the model of computer that had been

donated and the supplied modems. This finally explained the intermittent instability of the modems and extreme difficulty that many I-Med Exchange participants experienced in maintaining dial-up Internet connections. Confidence in the program by its frustrated participants had waned through these difficulties, despite sincere and thorough attempts to get the hardware to work. Many sites still remain affected by the modem problem as no budget was available to purchase new hardware for all participants.

Hosting of computers

The intention of placing computers in sites that most need them was not without complications. Public sector institutions are often risky environments in which to host valuable equipment, thus adequate provision needed to be made for security in a number of sites, whilst simultaneously ensuring that the computers remained accessible. In a few instances, delays in putting the necessary requirements in place have left the equipment completely unutilized, while the recipients insist that they are keen to retain their computers to use as soon as these arrangements have been effected. Applications have been made to facility administrators to put in place the necessary safeguards, but the typical response to significant delays is that this process usually "takes some time."

The foregoing points emphasize the importance of careful planning and a facility audit prior to shipping computers to remote areas. Unfortunately, the I-Med Exchange budget did not allow for site visits to all remote sites that had applied for participation and the applicants' assessment of their own environment had to be relied upon, giving them the benefit of any doubt, as there was clearly an enthusiastic and desperate need for physicians to obtain entry into the program.

In most sites, however, this problem with hosting was not an issue, and having the computers available has brought enormous benefit to these recipients. Included in this number, as well, are those who have experienced ongoing difficulties with connectivity, but still find the computers very useful in their work.

All of these experiences demonstrate how important careful planning and coordination, as well as local technical support, are in implementing IT solutions in low-infrastructure settings.

In almost all cases, this was not the first initiative dealing with IT deployment and in many instances there are existing government-sponsored IT service departments and projects that have been dealing with similar issues. These are often not located in the health services though, or comprise pilot projects or very specific services that are not well known to local health workers or managers. This makes them difficult to partner with from the outset.

The seemingly uncomplicated process of allocating personal computer equipment to public sector physicians, together with the sense of urgency in deploying the equipment and focusing on content of the program, was not the most prudent approach after all. Others could learn from this experience. Many months of careful planning "on the ground" may be necessary before fully understanding and addressing infrastructure requirements. In addition, assessment of how users' individual needs can be addressed and whether they are suitable candidates to enroll, is important to consider. Less ambitious, more geographically focused deployment of the program could have been more appropriate for the I-Med Exchange pilot, given limitations in resources and time.

Connectivity

Despite significant improvements and visionary plans in building telecommunications infrastructure for southern Africa, huge disparities still exist, and these became evident throughout the implementation of I-Med Exchange. Inadequate technology can be an absolute barrier to accessing information and communication.

Digital telephony in South African urban centers, for example, contrasts starkly with outdated analogue dial-up lines in rural areas (where they are even available). Difficulties in accessibility are further exacerbated by the relatively high costs of telephone services, all of which are charged by the minute.

In addition, telephone lines might not be available where the computers are meant to be used. In Swaziland, for example, many physicians moved computers into their homes in order to be connected through their personal phone lines.

Hosting a computer that requires Internet connectivity within public sector health facilities is also complicated by institutional regulations that tightly control telephone usage. This is done largely to reduce costs; avoid inappropriate usage of scarce communication resources (some hospitals only have a couple of telephone lines that serve the entire facility); and to limit calls to cellular and long-distance locations.

Participants in South Africa were provided with an ISP subscription through a provider that is a subsidiary of the national telephone company (Telkom), in order to allow all dial-ups to be achieved through a "Sharecall" service. Through this scheme, the user only ever pays for the cost of a local call, regardless of the location of the nearest "point-of-presence" of the ISP. Although this is the most sensible option, in some cases the "086" prefix of this number was interpreted by hospital "switch-boards" as being a restricted long-distance or cellular service. That raises the further issue of connecting to the Internet via hospital PABX switch-boards in general, which is often problematic. Many of the older PABX systems are not compatible with Internet connectivity, offering slow analogue connections or unstable switching.

Satellite connectivity

Technical consultants advised that I-Med Exchange should supply a satellite connection to all participants in remote sites and replace remaining modems with new external modems. The satellite option would require the installation of additional hardware and software and a monthly connection fee. The estimated total costs of maintaining satellite Internet access with a two-year contract for 86 computers was US$50,000 (including an initial cost per site of approximately US$300 for hardware and additional Internet subscription fees of US$240 per annum for each user).

Although the satellite solution was tested successfully, it was determined that providing satellite connections and replacing modems was too expensive and not within budget. Unfortunately, when technical difficulties were discovered and solutions found, the resources required to remedy these problems were not available.

Software applications

At the outset of the program, Akamai Technology, a leading provider of streaming audio and video for educational purposes, had agreed to host a series of 15 seminars for I-Med Exchange. Unfortunately, this arrangement proved technically impossible in pilot "test-runs" due to inadequate bandwidth.

Connectivity in Africa— remaining challenges and recent strides

Telecommunications connectivity has become part of the edifice upon which progress in the developed world depends. In Africa, the low level of prevailing infrastructure in most cases means that the continent will fall even further behind the rest of the world in quality of life indicators unless drastic steps are taken to address the situation.

There is no doubt that the communications and information infrastructure in Africa has improved dramatically over the past years. Satellite television, the Internet and cellular phones are now widespread on the continent. But what might have been completely unthinkable a decade ago, is still a dream for the vast majority of Africans—those who do not live in the capital cities and are not part of the privileged few. Access to telephones alone is still extremely scarce.

There are only about 14 million telephone lines on the continent—fewer than the number of phones in Manhattan or Tokyo—and if northern Africa and South Africa are not counted, there are only 3 million lines to be shared among the remaining 600 million people. Furthermore, most of the lines are concentrated in urban areas while over 70 percent of the population is rural.

As a result, most Africans have never even made a phone call, let alone surfed the web. There are only about 100,000 dial-up Internet accounts for 750 million people (excluding South Africa) and because Internet Service Providers (ISPs) are usually concentrated in the capital cities, even if there is a computer available, it is usually a prohibitively expensive long distance call to the Internet.

At the same time, most of the available information on the Internet is oriented towards western and urban populations, with few applications relevant to farmers, natural resource managers, women, youth and rural people on the African continent.

Africa's strategies for accelerating information infrastructure development have provided a rich diversity of approaches and a fascinating variety of responses to historical conditions. It is clear that concerted national strategies are being put in place, aimed at addressing these issues. In particular, restructuring of the telecommunication sector is increasingly coming to be seen and appreciated as vital to Information Communication Technology (ICT) development. Many countries have separated postal services from telecommunications and many countries now have a separate regulatory authority.

International capital and strategic partners have been obtained by some of the national PTOs but few second operators have been established as yet. Liberalization of the market for value-added services in some countries has resulted in a large number of various types of service providers.

There have also been some noteworthy efforts to expand telecommunication infrastructure to rural areas through the institution of Universal Service Obligations and funds for rural communications development. By setting targets for provision of services and connectivity, services have improved and the rate of telephone line rollout has increased.

Cellular phone service providers have been licensed in almost all African countries, which has brought network coverage to many rural areas that do not have telephone networks. Internet service providers (ISPs) are establishing their own independent links to the Internet, rather than being forced to go through the incumbent telecommunication operator's infrastructure. However, Internet access costs will still need to be reduced significantly before a wider spread of the population can make use of these services.

Telecom operators can play a vital role in reducing the cost of connection for those who are a long distance call away from the Internet service provider. This is the case, for example, in many Francophone countries where a special local call tariff applies to calls made to the Internet from anywhere in the country. However, even where it is a local call to the Internet provider, local call costs are still relatively high. The extensive use of wireless data services in the few countries that have sanctioned them is worthy of note. Clearly, wireless systems offer a number of advantages that will be increasingly in demand as the need for low-cost, high-bandwidth and reliable Internet connectivity becomes more important.

Improved public access to telephones, computers and the Internet, especially in rural areas, is clearly of concern to all developing countries, and new telecentre models will be of great interest to policy makers in the near future. Of particular note is the strong trend among small entrepreneurs to expand public phone businesses into mini-telecentres, when combined with an ISP's free e-mail services.

With respect to computer hardware, while import duties on computers in many African countries have come down substantially over the last few years, the continued high level of import taxes on computers in some countries is a barrier to accelerating the computerization process.

The liberalization of the broadcasting sector, which has taken place in many countries, has resulted in a significant increase in the number of independent broadcasters. However, while there are some notable community stations in a few countries, the majority of radio and television diversity is still concentrated in the capital cities, with usually only the state broadcaster reaching a wider listener- or viewership.

Many countries are developing national information and communication planning processes which are being conducted at high levels in government, and involving a broad range of stakeholders. While the impact of individuals who champion the cause of improved infrastructure should not be underestimated, it is also important to note the ongoing support of the international community in assisting many of these initiatives.

Between February 2001 and July 2001, I-Med Exchange was put on hold in an attempt to rectify the logistical and technical problems in the way of delivering Web conferencing. Centra software was added to the program in June 2001. Centra, a leading e-learning platform, was chosen because it was seen as more user friendly and could operate with a lower speed modem connection (28,800 bps) over low-bandwidth (ordinary telephone) dial-ups. Centra provides "integrated voice-over IP, over dial-up network connections." HIV/AIDS education would be delivered through an online classroom training platform and Web conferences would be offered to participating physicians.

Despite the expectations that Centra would help in resurrecting the program, an early evaluation in Botswana found that participants had problems with the complexity of Centra and the amount of time it took to download the initial file. Where the program works (mostly in South Africa, where adequate connectivity exists to a far greater extent), it is an impressive tool with huge potential. Further work is being done to find ways of improving access to this system and to address remaining obstacles, such as regulatory concerns.

Regulatory pitfalls

After implementing the highly functional Centra system, regulatory concerns were raised about IAPAC's use of "voice-over Internet protocol," the technology on which Centra's real-time communication capacity is based. Under current South African telecommunications legislation, "voice-over Internet protocol" is considered illegal, and this applies to all such communication originating from South Africa (and so impacts on all I-Med Exchange sites).

This legislation has been under review, as part of a larger restructuring of the telecommunications policy framework. In the meantime, IAPAC has attempted to seek further clarity on the issue and has taken a cautious approach to using the technology in I-Med Exchange, in anticipation of possible regulatory changes.

User barriers

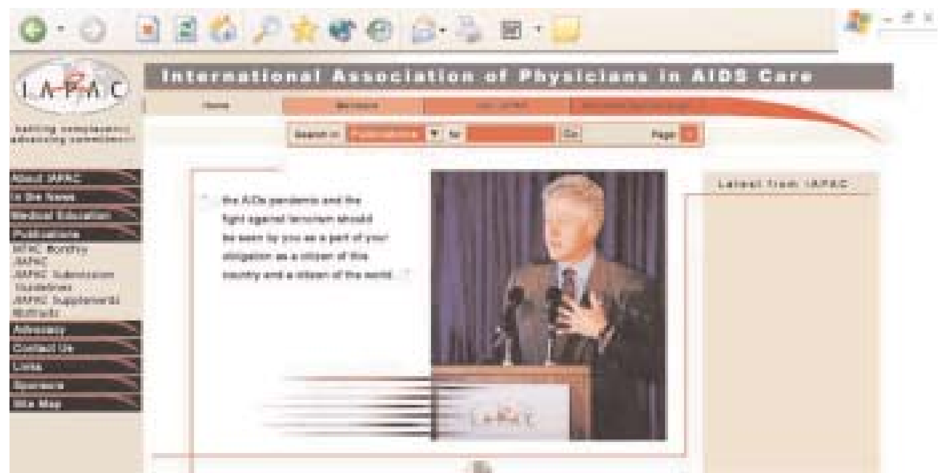
Basic computer literacy skills training was not provided to I-Med Exchange participants, which led to some less IT-experi-

enced participants becoming frustrated. This oversight emphasizes the importance of investing in user training as part of any technology-driven initiative (particularly when introducing new technology).

Implementing an IT intervention in developing countries requires devoted participants, since there is much to be learned by both the providers of this technology and participants. Barriers to utilization must be recognized and appreciated in order to understand and mobilize forces that will motivate and inspire physicians to continue using the system. To retain interest in such a program, there must be some reward or compelling benefit for devoting the time required. This incentive can be that the program offers unique information, or accreditation towards professional development.

I-Med Exchange program physicians agreed that they would participate in this pilot initiative but some deserted the program in frustration or through lack of motivation. Yet, many others strove to overcome the problems by their own resourceful measures. Nick Hone, a physician in Botswana, found the content of the program so useful that he gave up on his regular dial-up connection and connected to the sessions through a satellite service at his local Internet café. This is testament to the dedication of the vast majority of physicians in the region to finding creative solutions to medical education needs and care provision, something deserving of our unrelenting support. Further, Hone's example is a clear demonstration that there are alternatives for making I-Med Exchange work where conventional infrastructure is lacking. We must continue to research all possible solutions.

Other logistical barriers for users existed, however. Many physicians had difficulty with the timing of the online meetings, since some leave work before the scheduled time. It was difficult to find consensus on one meeting time. Also, some doctors are so busy with their practices that they could not commit the time required to participate in the program. This speaks to the general state of affairs, where physicians participating in ventures such as I-Med Exchange, are doing so at the expense of already limited personal time.



Accessing the latest in Internet-based information—including www.iapac.org.

Resource inputs and program sustainability

The costs of deploying, supporting, maintaining, and managing the large network of I-Med Exchange computers at remote sites across southern Africa were completely underestimated.

As mentioned, computer hardware received as a donation needed considerable additional expenditure to make it useful, and then over half of the internal modems supplied required replacing due to their incompatibility with the computers and further hardware failure.

Limited technical support was contracted through IT consultants in each country, but became prohibitive as the support requirements escalated mainly due to connectivity problems that required specialized investigations (which identified hardware failure as the primary cause only after some time and considerable expenditure). This also prolonged the program's implementation phase, which accumulated still further costs. The most beneficial alternative under these circumstances would have been to contract a commercial network of Compaq-preferred technical support providers on a monthly subscription per computer basis, to provide continuous on-site and telephonic support.

Centra Corp. and Dimension Data supplied their online learning and knowledge management applications to be used in this program at a highly reduced fee, but this still added significantly to unanticipated expenditure. An Internet and application server, together with hosting fees, was acquired to run the Centra application, at further cost.

Insufficient human resources were allocated to this program, which should ideally have employed at least the following: an IT technician; a Centra system administrator and support staff; and the project manager, originally budgeted for.

Given unavoidable delays in the implementation process, funding constraints were encountered where certain of the barriers could have been overcome with adequate additional resources. A number of applications were made for sponsorship and funding, specifically to replace faulty equipment and to enhance connectivity through satellite Internet. To date, however, no additional funds have been secured, but the basic program has continued to be subsidized by IAPAC through allocation of general revenue. A sustainability model has been designed that will attempt to generate revenues through expanding the user base and charging subscription fees. This is a scenario that would ideally be avoided, however, since the cost would prove prohibitive to many of the physicians who would want to take advantage of the program.

Outcomes and accomplishments

In the face of the many challenges and frustrations, the continuing dedication, enthusiasm and gratitude of most I-Med Exchange participants has renewed IAPAC's commitment to searching for ways to refine and improve the program. IAPAC continues, steadfast in this commitment, despite the absence of further donor funding after the pilot phase. Targeted proposals that seek funding for specific components of the service are still being generated and partnerships are being sought that can produce mutual value and strengthen I-Med Exchange's sustainability.

Numerous secondary benefits have accrued that have also catalyzed new ways of working together as a network of dedicated health professionals in this region. They have led to incremental contributions

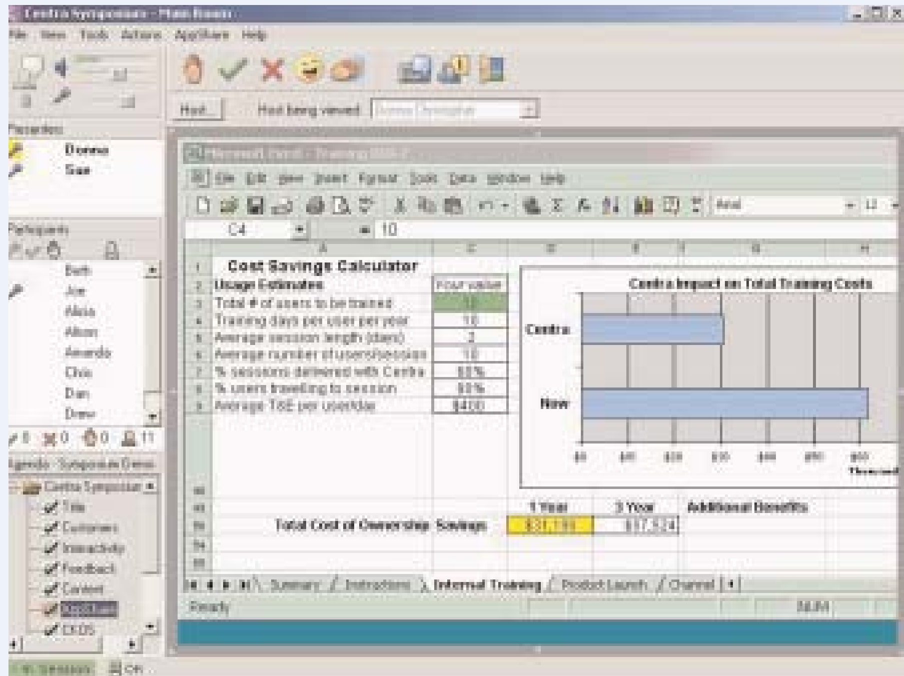
Connectivity in Africa — remaining challenges and recent strides

Learning for the right reasons

Medical education is based on a large body of knowledge and experience, both of which are perpetually changing. This is particularly true in the field of HIV, and takes on an added dimension in resource-limited countries where the information gap has widened due to the juxtaposition of the burgeoning HIV/AIDS pandemic against larger developmental impediments. In this environment, the complexity of medicine, in combination with time and infrastructure constraints, means that health professionals are forced to be highly proactive in maintaining their own knowledge and skills.

Just enough, just in time

There is a modern trend in learning towards the principle of "just enough, just in time." This is a practical and appropriate approach for individuals who are able to attain ready access to information and the current knowledge base. Learning is also becoming increasingly focused on producing specific outcomes in skills, attitudes and practices through facilitated training, shunning the traditional educational approaches that focus on accreditation and qualifications as exclusive ends unto themselves.



Sharing information and knowledge for quality and cost-effective HIV management.

Online opportunities

E-Learning is a medium that has the potential to prove an effective and cost-effective means by which to achieve these outcomes, by enabling health care professionals to learn in their own time, location and convenience, and in ways that meet their own specific needs.

Online learning further provides the opportunity for dynamic communication between many learners, in order to facilitate knowledge sharing and a participative learning process, across geographical spans.

Centra, the leading international e-learning company, provides an ideal software platform for medical education and skills development. IAPAC has been fortunate to acquire this cutting-edge application to incorporate into its I-Med Exchange program.

World-class e-learning

The Centra platform supports Web Meetings, Virtual Classrooms, Web Conferences, and management of Knowledge Portals.

Since I-Med Exchange is an Internet-based program using the Centra applications, the program is now able to provide virtual classrooms, web conferences and meetings to users of the system. These formats produce real-time and intuitive exchanges of information, documents, ideas and experiences.

Virtual Seminars, held on the Centra Symposium platform, are a distinguishing characteristic of IAPAC's training programs, allowing for a lively and enjoyable exchange that is extremely well facilitated by the system's tools.

Participants enrolled in I-Med Exchange will also enjoy easy access to appropriate information, in a timely manner, through an effective distribution channel enabled and managed by Centra. This offers enormous potential to improve communications and the sharing of knowledge and experience between disparate colleagues. This channel further facilitates professional development and meets individual needs by means of easily tailored learning programs that provide evaluations and automated professional accreditation.

Knowledge objects

The building blocks of I-Med Exchange's learning programs are referred to as Knowledge Objects. These Objects can be either "virtual" or physical depictions, descriptions, discussions or presentations of information and knowledge, captured in the full range of available media (including "multi-media"). Through Centra, I-Med Exchange participants are able to supplement their virtual classroom experience with extensive archives of Knowledge Objects, which can be easily accessed through the knowledge portal at the Centra-I-Med Exchange Web site.

Blended resources

IAPAC's Southern Africa Regional Office announced that it would be establishing an integrated virtual and physical regional resource center, linked to its Johannesburg offices, in April 2002. This IAPAC Southern Africa Resource Centre will augment the classroom experience of I-Med Exchange participants with a library of e-journals and electronic documents, as well as creating access to print and other media. The Centre will serve as an information and training resource repository for all health care workers in the region, and provide individual support to each Associate Member within IAPAC's regional Technical Resource Network. This network will further link them to the international community of IAPAC members, and offer opportunities for partnerships and participation in funded programs.

Catalysts for collaboration

Through IAPAC's initiatives and the use of cutting-edge tools, obstacles to learning, including geography and time, are gradually being overcome. Access to the world of up-to-the-minute information and further self-directed learning via other complimentary HIV/AIDS information portals (such as Medscape HIV/AIDS, Medguide, HIVchannel, AIDSchannel, AIDSline and many more) is becoming a reality.

In August 2002, the South African Medical Research Council (MRC) is also planning to launch a regional Internet information portal partnership for Southern Africa toward which IAPAC will contribute.

I-Med Exchange and other online resources may be seen as catalysts for building the interest, confidence, and skills of the community of health professionals who must respond to the HIV/AIDS epidemic in southern Africa. They also offer a unique opportunity for collaboration, development and information sharing.

To join this exciting learning opportunity and to join the I-Med Exchange connected community, contact bernie@iapac.org.za

and new prospects that have strengthened IAPAC's presence in the region through helping build a Technical Resource Network of Associate Members. These initiatives will continue to grow, supported by the new communication, collaboration, and information-sharing tools, infrastructure and experience that have been established through the program.

I-Med Exchange has been unique in its scale and is a groundbreaking mission to target some of the most under-resourced settings, where the need for this type of information and remote support was perceived to be greatest. Unfortunately, this mission is riddled by the difficulties and complications posed by the very location of these pilot sites—simply because

Table 2. **Access to technology in 2000**

Country	Total # Internet Users ('000)	Internet Users Per 10,000	Total # PC's ('000)	Computers per 100
Botswana	15	92.48	60	3.7
Namibia	30	170.78	60	3.42
Lesotho	4	18.58	na	na
South Africa	2,400	549.38	2,700	6.18
Swaziland	10	99.21	na	na
Egypt	450	70.89	1,400	2.21
Nigeria	200	17.57	750	0.66
United States	95,354	3,465.78	161,000	58.52
England	18 000	3,011	20,190	33.78
India	5,000	49.39	4,600	0.45
Thailand	2,300	379.49	1,471	2.43
Brazil	5,000	293.92	7,500	4.41
Argentna	2,500	675.09	1,900	5.13

Source ITU 2002

telecommunications infrastructure is still inadequate in many parts of rural southern Africa. Hopefully the bigger, politically supported drive toward building information communications technology capacity in Africa, as a vehicle for sustainable development, will change the landscape of what is possible over coming years.

No equivalent examples of either commercial or developmental initiatives exist, that have attempted to achieve a similar level of IT distribution across the rural expanses of the southern African region. At the same time, I-Med Exchange has also pioneered the deployment of software applications and communication tools that have never been used in this setting before. The program's achievements in this respect alone have been monumental.

The largest and most frustrating impediment to this program's success, created by a large and reputable company's oversight in donating computer equipment that did not function properly cannot and must not be neglected. This serves as an important reminder of what most commercial hardware suppliers already know—that IT is so much more than equipment. Technical service to back up hardware is an absolutely essential part of the equation necessary to make IT useful (in any setting).

The experience and insights gained through the pilot phase of I-Med Exchange have been substantial, since this program has challenged the boundaries of what is technically possible within low-resource infrastructure. Project staff, program participants, and IAPAC as the implementer, have demonstrated a high level of tenacity, perseverance, and innovation in the face of significant difficulties; something which provides more than a ray of hope that the initiation of this program will ultimately prove a major watershed event in combating the global pandemic.

Moving forward

Based on what has been learned, and the array of diverse opportunities that have emerged as a result of this program, IAPAC is ready to move forward with I-Med Exchange, at this point in a somewhat different format.

First, donated hardware is being recalled from certain sites and re-deployed to targeted key sites that have the necessary infrastructure and technical support in place. These limited sites, with their added hardware, will be used to initiate satellite Tele-Centers (linked to and supported by IAPAC's Regional Information and Training Resource Centre, that will serve as the "hub" of these peripheral sites).

"I-Med Plus" has been created to take advantage of the powerful applications in online learning and knowledge management provided by Centra. This will add to the basic services offered through I-Med Exchange by including access to HIV-related journals and other information resources.

Online training and collaboration sessions will be extended to include online case presentations and journal clubs. Key conferences (starting with IAPAC's 5th International Conference on Healthcare Resource Allocation for HIV/AIDS, which took place during April 2002) will be broadcast as "streaming" Web conferences.

Subscribers will also now be able to take advantage of a scheduling system in order to hold their own "online meetings" with groups of colleagues located anywhere in the world. This may be used for purposes of collaborating on research, to hold clinical or policy consultations, or for any other small or large group discussion/training session that may assist their work.

A "knowledge portal" is also being established as the "virtual" hub of IAPAC's Regional Informal and Training Resource Centre. This hub will provide access to growing archives of information and training "knowledge objects" that can be incorporated into individualized accredited learning programs, using the powerful functionality of "Centra Knowledge Center." I-Med Plus is being made available on a subscription basis to any individuals or institutions that have their own computers and Internet connections. I-Med Plus will also be used to support and facilitate collaboration among IAPAC's Technical Resource Networks of Training, Research, and Clinical Associates.

Much has been invested into I-Med Exchange as a pilot program that sought to demonstrate what role IT could have in supporting HIV/AIDS care within less developed settings. This comes not only by way of money, but also of time, energy and spirit. The program has evolved, by means of the implementation phase, from a visionary and pioneering idea into a realistic set of services and tools. These services and tools will continue to be enhanced, and can also serve to support other training, collaboration, and information management initiatives. In the process of this program growth and refinement, the I-Med Exchange experience has assisted in revealing other important opportunities, and has helped to build networks and regional focus among physicians.

The value of these lessons and secondary benefits cannot be underestimated and are the primary basis on which to define I-Med Exchange as having been a worthwhile initiative. As IAPAC, its partners, and those participating in I-Med Exchange look to the future, we are confident that the momentum and successes achieved to this point will ultimately prove but the root of a vast, flourishing tree of health and wisdom. ■

Patrick Connelly is the Director of Research and Development for the IAPAC Southern Africa Regional Office (SARO).

ABSTRACTS

Journal of the International Association of Physicians in AIDS Care

A Clinical Review of Micronutrients in HIV Infection

N Singhal and J Austin

Deficiencies of micronutrients are common in HIV-infected persons. They occur due to malabsorption, altered metabolism, gut infection, and altered gut barrier function. There is a compelling association of deficiencies of micronutrients in HIV-infection with immune deficiency, rapid disease progression, and mortality. Also, there is increased risk of vertical HIV transmission from mother to child with deficiency of vitamin A, and of neurological impairment with vitamin B_{12}. The last five years have been exciting in micronutrient research, and there is promise that some micronutrients may be key factors in maintaining health in HIV immunodeficiency, and in reducing mortality. Selenium appears important in reducing virulence of HIV and slowing disease progression. Vitamin A supplementation in pregnant women with HIV may reduce maternal mortality and improve birth outcomes. Supplementation in children with HIV may accelerate growth. Carotenoid supplementation is being evaluated. Vitamin B_{12} may slow HIV immune deficiency disease progression, and reverse neurological compromise. Clinical benefit of supplementation with some micronutrients may be measurable in the presence of pre-existing deficiency. Apart from improved general nutrition, the impact of micronutrient supplements on health and their optimal use in HIV infection is controversial because there are so few controlled clinical trials. Further research is needed to elucidate the role of micronutrient deficiencies on the course of HIV infection, and the preventive and therapeutic role of supplementation in its clinical management. Nevertheless, current knowledge supports the use of routine multivitamin and trace element supplementation as adjuvant to conventional antiretroviral drug treatment as a relatively low-cost intervention.

JIAPAC 2002;1(2):63-75

AIDS

Immune Reconstitution in HIV-1-Infected Children on Antiretroviral Therapy: Role of Thymic Output and Viral Fitness

Lucia Ometto et al

[The objective was] to investigate the role of thymic output and viral fitness in immune reconstitution in HIV-1-infected children on antiretroviral therapy. Thymic output was studied by measuring levels of T-cell receptor rearrangement excision circles (TREC) in peripheral blood lymphocytes, using a real-time quantitative PCR assay. Recombinant viruses containing pre-therapy or post-therapy HIV-1 protease domains were evaluated for viral infectivity in a quantitative single-cycle assay. Eighteen HIV-1-infected children who showed a significant increase in CD4 T-cell count after therapy were studied; HIV-1 plasma viraemia was substantially suppressed in 12 children (virological responders), but not in the other six (virological non-responders). TREC were quantified at baseline, and sequentially during the first 12 months of therapy. Both virological responders and non-responders showed an increase in TREC levels that was inversely correlated with baseline TREC and CD4 T cell counts. Changes in TREC positively correlated with CD4 T-cell count increases in virological responders, but not in non-responders; moreover, the ratios between TREC and CD4 T-cell count increases were higher in non-responders than in responders, suggesting a persistence of peripheral CD4 T-cell loss in the former. Drug-resistant viruses with reduced replicative capacity were documented in three out of six non-responders. These findings indicate that recovery of thymic function is a pivotal event in immune reconstitution, and suggest that CD4 T-cell increase despite persistent viraemia is sustained by a continuous thymic output that compensates peripheral CD4 T-cell depletion which might be slowed down by emerging viruses with reduced fitness.

AIDS 2002;16:839-849

Journal of Acquired Immune Deficiency Syndromes

Comparative Analysis of HIV-1 Viral Load Assays on Subtype Quantification: Bayer Versant HIV-1 RNA 3.0 Versus Roche Amplicor HIV-1 Monitor Version 1.5

T Elbeik et al

Quantification of HIV-1 subtypes is essential for appropriate clinical management. Whereas viral load assays were initially developed to accurately quantify subtype B, the recent worldwide spread of non-B subtypes and the introduction of treatment programs in regions with non-B subtypes have prompted adaptations of these assays. The Bayer Versant HIV-1 RNA 3.0 Assay (branched DNA [bDNA] 3.0) and the Roche Amplicor HIV-1 Monitor version 1.5 (Amplicor 1.5) assays are reported to quantify all subtypes in group M; however, evaluation of performance characteristics remains limited. In this study, we evaluated the accuracy and reliability of bDNA 3.0 and Amplicor 1.5 on multiple serially diluted viral isolates from HIV-1 group M, subtypes A through F. Testing was conducted on both assay systems in two independent laboratories. Comparative pansubtype quantification from regression analysis showed that quantification by bDNA 3.0 was approximately 0.3 log-fold lower than that by Amplicor 1.5. Comparative pansubtype accuracy analysis showed data points more closely distributed about their respective regression lines and thus showing greater reliability by bDNA 3.0 than by Amplicor 1.5.

JAIDS 2002;29:330-339

Clinical Infectious Diseases

Indinavir-Associated Interstitial Nephritis and Urothelial Inflammation: Clinical and Cytologic Findings

JB Kopp et al

The objective of the present study was to characterize the genitourinary syndromes that accompany indinavir-associated pyuria. Of 23 indinavir-treated patients with persistent pyuria, 4 had isolated interstitial nephritis, 10 had both interstitial nephritis and urothelial inflammation, 7 had isolated urothelial inflammation, and 2 had pyuria with nonspecific urinary tract inflammation. A total of 21 patients had multinucleated histiocytes identified by cytologic testing of urine specimens. Urine abnormalities resolved in all 20 patients who stopped receiving indinavir therapy. Pyuria continued in the 3 patients who continued receiving indinavir. Six patients had elevated serum creatinine levels, which returned to baseline levels when indinavir was discontinued. In conclusion, indinavir-associated pyuria was frequently associated with evidence of interstitial nephritis and/or urothelial inflammation, multinucleated histiocytes were commonly present in urine specimens, and cessation of indinavir therapy was associated with prompt resolution of urine abnormalities.

Clin Infect Dis 2002;34(8):1122-1128

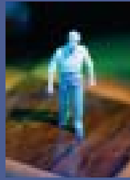
Journal of Acquired Immune Deficiency Syndromes

Lack of Hepatotoxicity Associated With Nonnucleoside Reverse Transcriptase Inhibitors

R Palmon et al

Nonnucleoside reverse transcriptase inhibitors (NNRTIs), particularly nevirapine, have been associated with hepatotoxicity. We performed a retrospective study to determine the incidence of NNRTI hepatotoxicity in a group of HIV-infected patients from a New York City practice. These patients are predominantly homosexual white males. We also analyzed the effect of coinfection with hepatitis B (HBV) or hepatitis C (HCV) virus. In total, 272 patients received NNRTIs: 40 (15%) received delavirdine, 91 (33%) received efavirenz, and 141 (52%) received nevirapine. Of the patients with known hepatitis status, 18 of 190 (9%) were coinfected with HBV, and 24 of 205 were coinfected (12%) with HCV. The overall rate of grade 3 to 4 elevations in aspartate aminotransferase (AST) or alanine aminotransferase (ALT) was 3 of 272 (1.1%) and did not differ significantly among the three NNRTIs. HBV or HCV was not associated with a significant increase in AST or ALT elevations. We conclude that NNRTIs are relatively free from hepatotoxicity in this population, despite the presence of coinfection with HBV or HCV.

JAIDS 2002;29340-345



Syed Ali Zaidi

Vanity Fair readers have every month since 1993 enjoyed *The Proust Questionnaire*, a series of questions posed to celebrities and other famous subjects. The *Vanity Fair* questionnaire—modeled after a questionnaire Marcel Proust was asked to fill out in the late 1800s—reveals much about the respondents' lives, thoughts, values, and experiences. Beginning this month, *IAPAC Monthly* introduces "In the Life," through which IAPAC will feature members who have been asked to bare their souls through their answers to ten questions.

This month, *IAPAC Monthly* is proud to feature Syed Ali Zaidi, a second year Fellow in the Division of Infectious Diseases at Long Island Jewish Medical Center (the Long Island Campus of the Albert Einstein College of Medicine), in New York.

What proverb, colloquial expression, or quote best describes how you view the world and yourself in it?
Perseverance commands success.

What activities, avocations, or hobbies interest you? Do you have a hidden talent?
I am an avid cricket player—a sport not widely known in the United States.

If you could live anywhere in the world, where would it be? Why?
Pakistan—to serve the vastly under-diagnosed and under-treated population.

Who are your mentors or real life heroes?
My father, who taught me never to give up; and my mother, who is the predominant reason for who I am and where I am today.

With what historical figure do you most identify?
Mohamed Ali Jinnah, the founder of Pakistan.

Who are your favorite authors, painters, and composers?
Authors: Sidney Sheldon and John Grisham. Painter: Picasso. and Composer: Beethoven.

If you could choose to live during any time period in human history, which would it be?
I would feel academically satisfied and intellectually appeased by living in an era when treatment and a cure for HIV is available.

If you did not have the option of becoming a physician, what would you have likely become given the opportunity?
A lawyer.

In your opinion, what are the greatest achievements and failures of humanity?
Achievement: Advances in medicine and surgery.
Failure: Apathy toward one's feelings and needs once you are in a superior position.

What is your prediction as to the future of our planet one full decade from present day?
Significant advances will be made in HIV treatment, and an HIV vaccine will be available. ■

[Strength in Numbers]

[IAPAC Welcomes New and Renewing Members]

In April 2002, the International Association of Physicians in AIDS Care (IAPAC) welcomed 54 new and renewing dues-paying physician members from seven countries. IAPAC thanks the following physicians for their support of the association's mission to improve the quality of care provided to all men, women, and children living with HIV/AIDS.

Nada Abou-Fayssal, *USA*
Kenneth Abriola, *USA*
Leonard Alberts, *USA*
Mario Alves, *USA*
Lee Anisman, *USA*
Sunkari Babu, *South Africa*
Alan Bulbin, *USA*
Jim Christensen, *USA*
Roseann Ciuffo, *USA*
Donald Cortum, *USA*
Sanford DeLeon, *USA*
Frank Duff, *USA*
Charles Farthing, *USA*
Ellis Frazier, *USA*
Jon Fuller, *USA*
Joel E. Gallant, *USA*
Barry Hartman, *USA*
Keith Henry, *USA*
Bruce Hirsch, *USA*
Vincent Jarvis, *USA*
Lori Kamemoto, *USA*
Nancy Kardori, *USA*
Ronica Kluge, *USA*
Francois Lebel, *USA*
Thomas Liberti, *USA*
Emmaunel Lim, *USA*
Luis Maldonado, *Ecuador*
Katherine Marconi, *USA*
Raymond Matta, *USA*
Linda McGhee, *USA*
Ronald Nahass, *USA*
Patrick Nolan, *USA*
Udeme Nwabuko, *Nigeria*
Donna O'Neill, *USA*
Joseph Piperato, *USA*
Anne Pittman, *USA*
Richard Presnell, *USA*
Nina Regevik, *USA*
Frank Rhame, *USA*
Barry Rodwick, *USA*
Arye Rubinstein, *USA*
Gisela Schneider, *Gambia*
Milton Seiler Jr., *USA*
Bitalo Sentongo, *South Africa*
Kenneth Skahan, *USA*
Corklin Steinhart, *USA*
Susan Szabo, *USA*
Patrick Tranmer, *USA*
Alcides Troncoso, *Argentina*
Dixon Valderruten, *USA*
Daniel Warner, *USA*
James Wernz, *USA*
Richard Wulfsburg, *USA*
Syed Ali Zaidi, *USA*

To learn more about how to become an IAPAC individual physician or allied health professional member, please contact Joey Atwell, Director of Membership, at (312) 795-4941 or jatwell@iapac.org.

[Recruit and Win]

Do you wish to strengthen the profession, enhance your colleagues' work, and win a prize? Your recruitment effort will not go unrecognized. Each time you recruit a new member, your name will be entered into a drawing to win one of the following prizes:

- One roundtrip, upgradeable, tourist class ticket anywhere United Airlines flies in the United States.
- One roundtrip, upgradeable, tourist class ticket anywhere United Airlines flies in Europe.

From March 1, 2002, to December 15, 2002, the more new members you recruit, the greater your chances of winning! Plus, you will receive recognition in the *IAPAC Monthly*.

Whether you sponsor one or 100 new members, you will receive a gift as recognition of your contribution to the success of this IAPAC membership campaign. There are four sponsorship levels; at the end of the campaign, you will receive a prize for the recruitment level you have met.

- Level 1 – Recruit one to four new members between March 1, 2002, and December 15, 2002, and receive an IAPAC lapel pin.
- Level 2 – Recruit five or more new members between March 1, 2002, and December 15, 2002, and receive an IAPAC lapel pin and a custom-designed plaque recognizing your commitment to IAPAC.
- Level 3 – Recruit 20 or more new members between March 1, 2002, and December 15, 2002, and receive Level 1 and 2 gifts and a 12-month complimentary extension of your IAPAC membership.
- Level 4 – Recruit 75 or more new members between March 1, 2002, and December 15, 2002, you may show off your accomplishment with a 10k yellow gold IAPAC lapel pin (and receive Level 2 and 3 gifts).

There is *Strength in Numbers*—encourage others to become IAPAC members. It is easy. To learn how easy, contact IAPAC's Membership Department at (312) 795-4941 or e-mail membership@iapac.org.

AIDS 2002 Barcelona
XIV INTERNATIONAL AIDS CONFERENCE
JULY 7-12 2002

Conference organizers call for immediate action

HIV/AIDS remains a global emergency with far reaching effects, and immediate action is necessary to prevent further catastrophe, this according to the organizers of the XIV International AIDS Conference, which will be held in July 7-12, 2002, in Barcelona.

In recognition of this global emergency, the conference organizers have prepared a list of nine key elements for immediate action.

"These nine elements form the guiding principles upon which the conference program is being developed. They reflect the reason we are holding this conference, as well as the reason why people should attend," said conference Co-Chair Jordi Casabona (who is Director of the Center for HIV/AIDS Epidemiological Studies in Cataluña, Spain).

The nine key elements are as follows:

1. HIV/AIDS is a global emergency with far-reaching effects: There is no country that has been left unscathed by the epidemic. It affects all countries socially, economically and culturally. It threatens development and human security.
2. Immediate action is necessary to prevent further catastrophe: Violence, poverty, insecurity, and war contribute to the spread of HIV/AIDS. In today's uncertain climate, HIV/AIDS demands increased focus, commitment, and effort. HIV/AIDS is a worsening crisis, which will increase further in times of war and instability.
3. Commitments of the United Nations Special Session on HIV/AIDS (UNGASS) urgently require implementation: In June 2001, world leaders met at UNGASS in New York City. The UNGASS Declaration sets out priorities and targets for fighting the epidemic on a global and a national level.
4. With political commitment given at UNGASS, there is now renewed opportunity for action: This action must be directed toward the creation of global, regional and national responses to HIV/AIDS that are sustainable and based on sound knowledge.
5. Knowledge must be used to translate commitment into action: The world has gained a vast amount of knowledge about effective strategies against HIV/AIDS from scientific inquiry and community mobilization. This knowledge must now be used to increase the scale and effectiveness of our response to this epidemic.
6. A unified effort is needed: All aspects of HIV/AIDS must be addressed by a unified body of scientists, politicians, people living with HIV/AIDS, community groups, religious leaders, business, and the media. All groups have valuable experience and lessons to share, and these can accelerate this shared response.
7. Decreasing the impact of HIV/AIDS depends on effective prevention: Prevention and care are complementary, not competing priorities. Effective prevention efforts that combine education, information, services and structural change to the social environment are needed on a massive scale around the world.
8. Access to care and treatment must be available to all people living with HIV/AIDS: Maximizing access to comprehensive care and effective treatment requires more support to communities, better health infrastructures, cheaper drugs and more resources. Resources for the new Global Fund to Fight AIDS, TB and Malaria (GFATM) need to be increased along with boosts to direct national and private sector spending on AIDS.
9. Social exclusion is at the root of HIV-vulnerability: Exclusion of people from social support and networks because of their religion, social standing, sexual orientation, HIV status, race, or gender contributes to vulnerability to HIV and worsens the impact of HIV. Extending dignity and respect to all people is therefore key to responding to HIV.

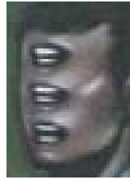
The theme of the XIV International AIDS Conference is "Knowledge and Commitment for Action." According to Co-Chair José M. Gatell (who is Head of the Infectious Diseases and AIDS Units at the Clinical Institute of Infectious Diseases & Immunology in Barcelona), this theme was selected to reinforce the need that scientists, the community, people working in the field, and the public and private sectors work together to review the knowledge gained through science and experience, and use this knowledge to commit to action. This action must be focused across all aspects of HIV and include all infected and affected groups.

Visit with IAPAC in Barcelona

battling complacency
advancing commitment

The International Association of Physicians in AIDS Care (IAPAC) will be well represented at the XIV International AIDS Conference. In addition to the participation of IAPAC members and staff in plenary and poster sessions, IAPAC will have a booth presence within the conference's exhibition area (Hall 2 of the Fira de Barcelona Conference Center). IAPAC staff from Chicago, Johannesburg, Paris, and Toronto will be present at the booth throughout the conference to meet with you and entertain your questions and/or suggestions. Please visit Booth No. A50 to learn more about our activities worldwide, to become a member, or to renew your membership.

If you are not planning to attend the XIV International AIDS Conference, sign up for AIDScan to receive daily conference highlights via facsimile or e-mail. This program is made possible through an unrestricted educational grant from Bristol-Myers Squibb Virology. To sign up, simply send an e-mail with your name and fax number/e-mail address to barcelona@iapac.org no later than July 1, 2002.



We have to raise more money, that's for sure. The fight against AIDS alone requires between [US$7 billion and US$10 billion] globally. The fund was never envisaged as the sole source, but as an additional mechanism.

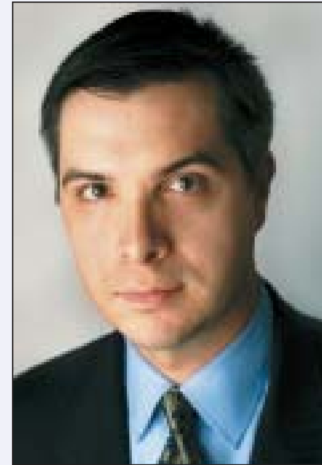
Melanie Zipperer, a spokeswoman for the Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM), quoted in the April 6, 2002, issue of the British Medical Journal *(Volume 324, No. 807). According to Zipperer, the GFATM has been overwhelmed with applications from developing countries. To date, the GFATM has received US$1.92 billion in pledges from developed countries and private donors. Of that, US$700 million to US$800 million is expected to be disbursed this year and the rest in 2003. Funding requests from developing countries now exceed US$1.15 billion—US$641 million worth of requests came from 36 African countries.*

Let's get out of this conflict now. You've gone to the highest court, you've been to the court three times and on each occasion the judges have found you wanting. So be modest and accept that you were perhaps wrong.

Mark Heywood of the Treatment Action Campaign (TAC) quoted in an April 5, 2002, Inter Press Service report entitled, "[Government] Runs Out of Legal Options to Prevent AIDS Drugs." Heywood was addressing the South African government, which was dealt a defeat April 4, 2002, when South Africa's Constitutional Court ruled that the government must not delay implementation of a lower court's order to make nevirapine available through the public health system as prophylaxis against mother-to-child HIV transmission. The government had hoped to delay implementation until its appeal of the lower court's order was complete. According to TAC activists, the Constitutional Court's ruling may be an indication that the highest court in South Africa may turn down the government's appeal. The Constitutional Court is due to hear the government's appeal in May 2002.

5th International Conference on Healthcare Resource Allocation for HIV/AIDS
April 15-17, 2002 – Rio de Janeiro, Brazil

Debrework Zewdie



José M. Zuniga

… Twenty-one years into the pandemic, we cannot just sit back and complain about the devastation wrought by HIV/AIDS, nor wallow in criticism of globalization.

José M. Zuniga, President of the International Association of Physicians in AIDS Care (IAPAC), in his opening remarks April 15, 2002. Zuniga and other delegates called for harnessing globalization for the benefit of men, women, and children worldwide, but with special emphasis on those living in developing world countries.

Far too many developing countries have neglected their health systems over the past generation… AIDS is a wake-up call, and it will not be the last. The fact that so few health systems now have the foundation in place to administer widespread therapy gives these countries the strongest possible motivation for giving these systems the attention they deserve.

Debrework Zewdie, Coordinator of the World Bank's Global AIDS Campaign, in her keynote address April 15, 2002.

Zewdie warned delegates that if the opportunity presented by HIV/AIDS is not seized, it might take the next generation and/or a future pandemic before another opportunity arises.

Unfortunately, all these efforts pale into insignificance compared to political stability, political will, population and product acceptability, and comparative worth.

Mike Youle, Director of HIV Clinical Research at the Royal Free Centre for HIV Medicine in London, during his April 16, 2002, presentation entitled, "Preconditions and Challenges to Expanded Antiretroviral Access in Resource Limited Settings." Youle urged delegates to advance advocacy around a broad, multisectoral framework that includes, but is not limited to lowering drug prices, strengthening healthcare capacity, and simplifying treatment regimens.

Editor's Note: Look to the July 2002 issue of *IAPAC Monthly* for a summary of this IAPAC conference's proceedings.