Integration of HIV and other Prevalent Infectious Diseases into Primary Medical Care in Central America and the Caribbean:

Online and On-site Methodologies to Improve Knowledge, Attitudes and Practice

Baseline Evaluation Report

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CIESAR	Centro de Investigación Epidemiólogica en Salud Sexual y Reproductiva
CRECS	Centro Regional de Capacitación en Salud
GORGAS	Instituto Conmemorativo Gorgas
HHS	Department of Health and Human Services
HBV	Hepatitis B Virus
HIV	Human Immunodeficiency Virus
JHU	Johns Hopkins University
KAP	Knowledge, Attitude and Practice
OGHA	Office of Global Health Affairs
PAHO	Pan American Health Organization
RH	Reproductive Health
SILAIS	Sistemas de Atención Integral de Salud
SRH	Sexual and Reproductive Health
SRR	Sexual and Reproductive Rights
STI	Sexually Transmitted Infection
WHO	World Health Organization

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EXECUTIVE SUMMARY

This report characterizes baseline knowledge of HIV and related infectious diseases (RIDs) among primary health care (PHC) service providers, users and managers in Guatemala, Nicaragua, Panama and the Dominican Republic and assesses the extent to which a training course using online and on-site methodologies produced a change in health providers' knowledge and attitudes as compared to the baseline diagnosis. The report also identifies specific aspects that contributed to intervention success, as well as disadvantages and factors in each of the countries that could potentially have inhibited expected outcomes. Results are expected to help define the objectives and methodology to be applied in the final evaluation of intervention effectiveness.

Increasing numbers of people living with HIV in resource-poor settings requires special effort to identify vulnerable population groups, prevent its transmission and diagnose and treat people in a timely manner. This has implications for communities and the health system at large, particularly for the health workforce who must be prepared to not only step up prevention efforts, but also be fully capable of managing HIV infected patients as a chronic disease while taking into account HIV-specific aspects such as stigma and discrimination. Three of the four participating countries have experienced increases in the absolute number of cases of HIV among adults, children and women, which translates to increased costs for families and health care services. Furthermore, all the departments and provinces included in the study were underserved communities.

Three questionnaires were created to determine baseline Knowledge, Attitudes and Practice (KAP) regarding the integration of HIV and RIDs health services into PHC. The first questionnaire was designed for directors of the selected health services facilities and focused on institutional knowledge of the organization and integration of health services at the first level of care, coordination with the health system and the comprehensive provision of services for HIV/AIDS and RIDs. Assessing population knowledge of HIV is also of utmost importance. As such, another questionnaire was designed to collect information and opinions from health service users, who were asked about their perception of services received for HIV, sexually transmitted infections (STIs) and sexual and reproductive health in general. Finally, the third questionnaire aimed to assess the KAP of physicians, nurses and health educators. This questionnaire was particularly important, as course participants were expected to be selected from the sample of baseline respondents.

For all questionnaires, macro-indicators were constructed from combining the answers to several key questions to indicate basic knowledge and attitudes in six areas: 1) Transmission and prevention of HIV and RIDs, 2) Integrated health services for HIV, 3) Prevention of vertical transmission of HIV, 4) HIV and VDRL testing and counseling, 5) HIV-related stigma and 6)HIV care improvement processes.

A total of 1,732 interviews were carried out across the four countries (943 with outpatients, 794 with health care providers and 47 with health facility managers). The baseline KAP of health service providers, managers and users at the primary care level regarding HIV and RIDs can be summarized as follows:

PHC service user knowledge. At minimum, people should know that HIV can be transmitted from mother to newborn, that vertical transmission happens during labor, that HIV positive women should not breastfeed, that AIDS is incurable and they should know the basics about syphilis, genital herpes and HIV. As measured by the macro-indicator of HIV transmission knowledge, less than 10% of PHC users answered all of these questions correctly. However, when measured on a scale of 0 to 100, users answered between 60% and 70% of questions, indicating knowledge of some topics.

Integration of HIV services. The majority of health service providers and managers reported that HIV testing is offered during prenatal care, but a low proportion of women interviewed who had been or were pregnant said they had been tested or counseled or had been given test results. When asked whether their facility offered HIV testing and counseling, distributed condoms and had measures in place to avoid vertical transmission, none of the directors interviewed answered all of these questions affirmatively. Furthermore, when asked about referral systems, how to proceed with AFB positive patients and HIV testing during prenatal care, only respondents in Nicaragua said their facility met all of these criteria.

PHC service provider knowledge. Basic knowledge of HIV and RIDs was lacking overall. For example, for the macro-indicator on health provider knowledge of transmission, prevention and treatment of HIV, none of the respondents knew all of the answers. Taken separately, most KAP indicators revealed intermediate or deficient knowledge, with an overall average of approximately 50%. Less than half of providers were knowledgeable about the importance of getting tested for HIV and syphilis during prenatal care.

HIV-related stigma. Stigma towards HIV infected people was found to be higher among PHC service users than professionals, but worryingly, it was also observed in health care providers.

The training strategy, consisting of two four-week long online modules and a classroom-based course, was expected to improve health providers' baseline KAP in the following areas:

- Increase health provider knowledge of HIV and RIDs service provision.
- Increase provider knowledge of the importance of HIV and syphilis counseling during prenatal care.
- Increase the clinical management knowledge of providers.
- Improve provider knowledge of social determinants.
- Improve attitudes about prevention, diagnosis and treatment of HIV and RIDs.

The first module was organized by the Pan American Health Organization (PAHO) and focused on the integration of HIV care in a PHC renewal framework through five main topic areas: 1) social, political and economic factors influencing HIV and RIDs; 2) the organization of HIV health care services; 3) integration of HIV prevention and promotion strategies in the maternal-infant health field; 4) local clinical strategies and tools for the control of HIV; and 5) intervention and improvement proposals in the above areas. The themes of gender, ethnicity and discrimination and stigma were introduced as cross-cutting topics.

The second module designed by Johns Hopkins University (JHU) focused on the clinical management of HIV and other prevalent infectious diseases at the first level of care. The four week-long topics were: 1) initial management of HIV infected patients, 2) HIV in pregnant women, 3) opportunistic infections and chronic management of HIV and 4) other prevalent infections.

Upon completion of the online components, participants attended the on-site course at the Gorgas Memorial Institute in Panama City, which aimed to reinforce the concepts from the online components and promote discussion and analysis of issues presented by speakers, mentors and participants during the online training. Assessment of pre and post-intervention results for all training methodologies revealed the following:

Social determinants, organization and integration of HIV care, and local solutions. As measured by each participant's initial and final essay for the PAHO-led course, on a scale of 0 to 15 the overall average score increased by nearly two points. With the exception of the Dominican Republic each individual country also improved. This increase was greatest in Nicaragua (2.9 points) and Guatemala

(2.7 points), and modest in Panama (0.2 points). Despite the overall improvement between the essays composed at course initiation and completion, the final essays showed gaps in knowledge and attitudes, especially for the cross-cutting themes of gender, ethnicity and discrimination. The level of analysis observed in the essays also tended to be low. Qualitative analysis revealed weaknesses in the respective health systems of course participants that likely affected their potential KAP.

Clinical management and HIV and RIDs. Tests were taken before and after each weekly module for the online component led by JHU. At completion of each week-long module, students from all countries had scores above 75 points on a scale of 0 to 100. Students increased their clinical knowledge by an average of 76.8 points each week. The increase observed in clinical knowledge between baseline and course completion was significant ($P < 0.05$) for every country.

Reinforcement of concepts from online courses. The on-site course evaluation was based on a written test taken prior to course initiation and repeated upon course completion consisting of six multiple-choice questions on counseling, diagnosis and treatment and 15 questions aimed at evaluating opinions on these topics. Although the average final score was less than 50 points (on a scale of 0 to 100), knowledge rose significantly ($p < 0.05$) between baseline and final exams – 14.3 points on average.

Once all methodologies were standardized to the same scale, all training course evaluations comparing initial versus final knowledge showed improved results among participants in all countries. However, the strength of the observed trend at completion of the PAHO course and the JHU course, diminished upon completion of the on-site course, which at 50 points, was similar to the baseline average. This demonstrates a need for further analysis of how the two methodologies (online vs. on-site) compare in terms of effectiveness and efficiency. Thus one recommendation of this baseline evaluation is that these complementary methodologies be evaluated in greater detail.

For example, we suggest some changes in format for the PAHO online course, such as expanding the curriculum to include teaching and learning activities to help relate the different concepts presented in the lectures, tailoring activities to different participants' level of education, standardizing tutors' instructions, re-wording questions to facilitate analytical work and above all, re-considering whether the essay format is the most suitable type of learning assessment methodology.

However, the essays evaluated for the PAHO online course contain valuable information and ideas that should be recognized by the course organizers and that, in conjunction with health authorities, could be used for making system improvements. A substantial amount of time and resources have been invested in the course by both the organizers and the participants who expressed a variety of opinions about their local health systems. Therefore, we suggest that the organizers of the course use the essays in the form of local assessments.

Only 34% of health providers from Guatemala, 26% from Nicaragua, 61% from Panama and 52% of providers from the Dominican Republic were from the selected communities and had therefore been interviewed during the study's baseline phase. Since the original target was 95% from each country, another recommendation is to define the methodology to be used in the final evaluation of the project according to the original design proposed for the evaluation. We hope that these baseline data will be used to inform the final evaluation of program effectiveness.

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Integration of HIV and other Prevalent Infectious Diseases into Primary Medical Care in Central America and the Caribbean: Online and On-site Methodologies to Improve Knowledge, Attitudes and Practice

Baseline Evaluation Report

1. Background information

Once thought to be an issue primarily affecting older populations in high-income countries, noncommunicable diseases are now affecting younger population segments and the poor in the low- and lower-middle-income countries in Latin America and the Caribbean (LAC). These countries currently face a dual challenge in applying scarce resources to address both noncommunicable and communicable diseases including infant and maternal morbidity and mortality. Adding to this challenge are cross-cutting chronic conditions which may be either communicable or noncommunicable.

One of the most important examples of this phenomenon is human immunodeficiency virus (HIV/AIDS), which has progressed from a highly lethal infectious disease in the early 1980's to a complex, chronic disease. HIV-infected patients now have greatly increased life expectancy through the use of appropriate potent antiretroviral therapy, prophylaxis and/or treatment for opportunistic infections, routine vaccinations, general medical health screenings and the promotion of healthy activities including safer sex.

However, this care is multifaceted and costly and requires the coordinated efforts of a range of different health care professionals. Thus, health sector progress is key to achieving universal access to HIV/AIDS prevention, treatment and long-term care; which in turn necessitates trained personnel to identify, diagnose and manage patients with HIV/AIDS.

Despite the technical and financial efforts made since the emergence of HIV/AIDS, they remain a major public health problem in most countries. The following table shows the estimated number of adults and children living with HIV in 2001 and in 2007 in the intervention's four participating countries: Guatemala, Nicaragua, Panama and the Dominican Republic.

Table 1. Estimated number of adults and children living with HIV (thousands)

Population group	Guatemala		Nicaragua		Panama		Dominican Republic	
	2001	2007	2001	2007	2001	2007	2001	2007
Adults and children	52 (38 – 68)	59 (41 – 84)	4.4 (3.2–15)	7.7 (5.3-15)	17 (13-21)	20 (16-26)	65 (53-76)	62 (52-71)
Adults (15+)	48 (35 – 62)	53 (35 – 77)	4.3 (3.1-15)	7.5(5.2-15)	16 (13-21)	19 (15-26)	63 (50-73)	59 (50-69)
Children (0 - 14)	---	---	---	---	---	---	2.7(2.2-3.5)	2.7 (2.2-3.3)
Women (15+)	47 (35 – 62)	52 (35 – 76)	1.1 (<1-3.9)	2.1 (1.4-3.9)	4.3 (3.2-5.6)	5.5 (4.1-7.6)	34 (27-39)	30 (25-35)
Adult prevalence (15–49) (%)	0.8 (0.6 –1.1)	0.8 (0.5 – 1.1)	0.2 (0.1-0.5)	0.2 (0.1-0.4)	1.0 (0.8-1.2)	1.0 (0.8-1.3)	1.3 (1.0-1.5)	1.1 (0.9-1.2)

Source: UNAIDS/WHO Working Group on Global HIV/AIDS and STI. These estimates include all people with HIV, whether or not they have developed symptoms of AIDS.

During the six-year period, three of the participating countries show an increase in cases of HIV among all adults, children and women, which translates to increased costs for families and health care services. The only exception is the Dominican Republic, where the number of prevalent cases decreased and in the case of children, stayed the same, during the period.

Appendix 1 presents detailed demographic, socioeconomic and health indicators for each country. With nearly 22 new cases per 100,00 inhabitants, Panama has the highest incidence of AIDS cases, followed by

Guatemala (8.9), Dominican Republic (3.4) and finally Nicaragua (1.7). Panama also has the highest male to female ratio of AIDS cases.

Of the four countries, Guatemala has the largest total population with just over 14 million inhabitants, followed by the Dominican Republic with more than 10 million. In combination with the highest crude birth rate of the four countries - explained in part by a total fertility rate of four children per woman - Guatemala also has the largest number of annual births and the highest dependency ratio.

In addition, Guatemala has some of the worst socio-economic indicators of the four countries. For example the lowest literacy rate is observed; furthermore only 68% of women are literate compared to 79% of men. More than half its population is rural, which has important implications in accessing health care services. Nicaragua also has a smaller urban population (57%) relative to Panama and the Dominican Republic, and has the worst economic indicators of the four countries. As an indicator of poor social determinants of health, Guatemala has the highest maternal mortality ratio by far, though its under-5 mortality rates are similar to those of Nicaragua and Dominican Republic. Panama has the lowest child mortality, 23 deaths per 1,000 live births.

Increasing numbers of people living with HIV in resource-poor settings requires special effort to identify vulnerable population groups, prevent its transmission and diagnose and treat people in a timely manner. This has implications for communities and the health system at large, particularly for the health workforce who must be prepared to not only step up prevention efforts, but also be fully capable of managing HIV infected patients as a chronic disease while taking into account HIV-specific aspects such as stigma and discrimination.

One response to this challenge emerged in September of 2009, when the U.S. Department of Health and Human Services (HHS) signed a letter of agreement between the Office of Global Health Affairs (OGHA) within the HHS Office of the Secretary and the Office of the Surgeon General and the Office of Force Readiness and Deployment within the Office of Public Health and Science, to develop a Health Diplomacy program constructed with reference to the World Health Organization (WHO) Framework on strengthening health systems.[1] Working with the WHO Framework, this initiative will set the stage for collaborations with interested national and multilateral bodies to undertake programs that could systematically strengthen national health systems in all regions as a long-term solution to existing health care needs.

The main objectives of the agreement were: to improve health service coverage, delivery, quality, safety and efficiency; to synthesize and share experiences regarding the costs, benefits and conditions for success of strategies to improve health services delivery; to develop regional and national institutional capacity and resources to support local health managers; and to produce a range of health workers (service providers, managers and support staff) to deliver health services. A secondary objective was to maintain and enhance U.S. Public Health Service Commissioned Corps readiness and effectiveness to respond to public health emergencies and urgent public health needs under hardship conditions.

Subsequently, the OGHA announced the availability of funds for a one-year competitive cooperative agreement. The overarching goal of the cooperative agreement is to strengthen health systems in the LAC region by supporting the development of a local health workforce that is responsive, fair and efficient in order to achieve the best possible health outcomes given available resources and circumstances. The program provides training in the LAC region and fosters health care professionals' commitment to sustained service in underserved communities in their home countries. The program builds on the lessons learned from multiple HHS global health missions. With respect to needs and capacity, the program incorporates

[1] World Health Organization, Strengthening Health Systems to Improve Health Outcomes, WHO´s Framework for Action. Available at http://www.who.int/healthsystems/strategy/everybodys_business.pdf

intelligence from LAC country reports produced by the WHO and the Pan American Health Organization (PAHO).

Established as a Regional Health Training Center (CRECS in Spanish) in 2006, the Gorgas Memorial Institute of Panama serves as a dedicated space to train health workers in Central America and the Caribbean, and thus competed for and obtained funds made available for the Health Diplomacy initiative "Support and Development of the Health Workforce in Latin America and the Caribbean." The Institute proposed a combined classroom and distance (online) training course on the integration of HIV and other prevalent infectious diseases at the primary care level. The proposal was developed in collaboration with John Hopkins University (JHU), who was responsible for the course component on clinical training in the management and treatment of patients with HIV/AIDS and PAHO, who contributed the course component related to the social determinants of health and HIV; health policies, systems and services; renewal of primary care; and development of human resource skills to improve the efficiency of health services.

There are a number of reasons that an online format was chosen as the primary methodology for this training intervention. Applying virtual technology at the primary health care (PHC) level in the selected countries will allow the intervention to reach health workers at a much lower cost than traditional training strategies, thus reaching many who otherwise may never have had this opportunity. Additionally, Web-based learning is thought to be advantageous due to its flexible scheduling, economies of scale, ease in updating, and the potential for the delivery of individualized teaching.[1]

It is not yet clear which learning objectives might be best achieved using computers as opposed to attending real teaching sessions.[2] Computer-assisted instruction (CAI) has not been found to be superior to traditional teaching methods in acquiring factual knowledge.[3] However, there is evidence of an effect of CAI on the development of problem-solving skills.[4] Modern learning management systems[5] seek to merge computer technology with interactive features as provided by the Internet.

Table 2. Selected Random-Effects of Meta-analysis of Internet-Based Learning versus No Intervention: Knowledge Outcomes

Subgroup	No. of interventions	Pooled Effect Size	P for interaction
Design			
Posttest only	25	0.66 (0.53 - 0.78)	
Pretest-posttest, 2 group	25	0.88 (0.67 - 1.08)	<.001
Pretest-posttest, 1 group	76	1.18 (1.04 – 1.32)	
Setting			
Classroom	35	0.91 (0.74 – 1.08)	.29
Practice	90	1.02 (0.91 – 1.13)	
Participants			
Medical students	36	0.97 (0.78 – 1.16)	
Physicians	58	1.02 (0.88 – 1.15)	
Nurses	21	0.88 (0.69 – 1.06)	
Others	32	1.20 (0.98 – 1.43)	
Practice exercises			
Present	69	0.95 (0.82 – 1.09)	.34
Absent	54	1.05 (0.91 – 1.18)	
Duration			
≤ 1 wk	48	1.00 (0.85 – 1.16)	.65
> 1 wk	61	1.05 (0.90 – 1.21)	
Tutorial			
Yes	108	1.06 (0.95 – 1.17)	<.001
No	18	0.65 (0.51 – 0.80)	
All interventions	126	1.00 (0.90 – 1.10)	

A recent meta-analysis reviewing a total of 201 published articles on the effectiveness of Internet-based learning concluded that when compared to no intervention, Internet-based interventions have large and significant effects on the acquisition of knowledge, skills and behaviors[6] (Tables 2 and 3). However, when compared with non-Internet formats, effects are of marginal size and predominantly non-significant.

Table 3. Selected Random-Effects of Meta-analysis of Internet-Based Learning versus No Intervention: Skills Outcomes

Subgroup	No. of interventions	Pooled Effect Size	P for interaction
Design			
Posttest only	8	0.84 (0.26 – 1.42)	
Pretest-posttest, 2 group	5	1.11 (0.46 - 1.76)	.45
Pretest-posttest, 1 group	3	0.40 (0.07 – 0.73)	
Setting			
Classroom	4	0.28 (-0.01 – 0.57)	.004
Practice	10	1.11 (0.63 – 1.69)	
Participants			
Medical students	8	0.94 (0.32 – 1.56)	
Physicians	3	1.19 (0.19 – 2.19)	
Nurses	3	0.72 (-0.03 – 1.47)	
Others	6	0.87 (0.43 – 1.30)	
Practice exercises			
Present	13	1.01 (0.60 – 1.43)	<.001
Absent	3	0.21 (0.04 – 0.38)	
Duration			
≤ 1 wk	8	0.92 (0.39 – 1.45)	.88
> 1 wk	5	0.85 (0.08 – 1.61)	
All Interventions	16	0.85 (0.49 – 1.20)	

As stated above, the course comprised online (April-May) and on-site (June-September) components. The online course consisted of two four-week long learning modules. The first PAHO-led module analyzed the integration of HIV care in a PHC renewal framework. The second module designed by JHU focused on the clinical management of HIV and other prevalent infectious diseases at the first level of care. Upon completion of the online component, CRECS then carried out the on-site course, which aimed to reinforce the concepts from the online training.

Participants were expected to gain the following competencies upon completion of all course components:

- Analyze the global context of the organization of health service delivery.
- Distinguish between the organization of national and local health systems and services.
- Integrate tools that facilitate the promotion, prevention, diagnosis and treatment of HIV into the workplace, particularly in the prevention of mother to child transmission of HIV, congenital syphilis and related infectious diseases (RIDs).
- Apply clinical tools to improve service provision to people at risk of contracting HIV and other prevalent infectious diseases.
- Propose sustainable interventions, including interventions that focus on training in the context of one's own workplace, to improve the efficiency of care delivered (see program at: http://cursospaises.campusvirtualsp.org.)

The Center for Epidemiological Research in Sexual and Reproductive Health (CIESAR in Spanish), based in Guatemala City, is responsible for evaluating baseline indicators as well as results obtained from the online and on-site courses, using the methods described in the following sections.

2. Evaluation purpose and objectives

Lacking any of the information necessary to evaluate processes and outcomes can waste essential resources and deviate from desired outcomes. Therefore, to evaluate the effectiveness of the training course – i.e., measure changes in participants in terms of their knowledge and behavior in delivering care to patients – a series of evaluations were carried out. The evaluation was designed prior to course implementation and rolled out during four phases:

1) Design and validation of data collection instruments and the selection, hiring and training of each country's field team (see Baseline Data Collection Methods).
2) Collection and analysis of baseline information, which was collected in the four selected countries prior to launching the online course (see Baseline Evaluation Findings).
3) Assessment of pre and post-intervention results for online and on-site components, consisting of:
    a. Analysis of each participant's initial and final reflection on the virtual course led by PAHO regarding the management and public health content learned (see Evaluation of PAHO online course).
    b. Results of the weekly pre and post tests on the clinical care and management component given by JHU (see Evaluation of JHU online course).
    c. Results of the baseline exam taken at the beginning of the first week and the final exam taken at end of the course in Panama City (see Evaluation of GORGAS on-site course).
4) Overall course evaluation by the participants six weeks after course completion (not included in this report).

The purpose of the baseline evaluation is to propose a theoretical framework to determine whether the online and on-site courses respond to the institutional strengthening needs of the four participating countries regarding PHC services. Evaluating if this objective was met implies assessing if course participants improved their knowledge in the diagnosis, treatment and management of HIV and RIDs. As such, it presents baseline indicators obtained data collected in the four participating countries and assesses the knowledge acquired after each course component is completed. In addition, this evaluation identifies specific aspects that contributed to intervention success as well as disadvantages and existing influencing factors in each of the countries that could potentially have inhibited expected outcomes.

This report does not evaluate changes in participants and their communities in terms of if and how the intervention succeeded in developing organizational and PHC capacity sufficiently to improve integrated service delivery to patients with HIV/AIDS and RIDs at the first level of care; this can only be determined in a future final evaluation of program effectiveness. However, baseline data and data collected during the courses to date can help determine how effective the strategy was in:

- Increasing health provider knowledge of HIV and RIDs service provision.
- Increasing provider knowledge of the importance of HIV and syphilis counseling during prenatal care.
- Increasing the clinical management knowledge of providers.
- Increasing provider knowledge of social determinants.
- Improving attitudes about prevention, diagnosis and treatment of HIV and RIDs.

Thus, this report assesses whether and to what extent the online and on-site courses produced a change in participants' knowledge and attitudes, as compared to the baseline diagnosis. These results will help define the objectives and methodology to be applied in the final evaluation.

3. Baseline data collection methods

Since course enrollment was not subject to a random process, as would allocation to treatment in a clinical trial, this report presents baseline results of an **observational** study which could be complemented by a prospective study involving following up with health personnel in a final phase (see Appendix 2). Ideally, this prospective study would take into account some of the findings of this report in its assessment of the best methodology to evaluate final outcomes.

3.1 Data collection instruments.

Three questionnaires were created prior to course implementation to determine baseline Knowledge, Attitudes and Practice (KAP) regarding the integration of HIV and RIDs health services into PHC.

The first questionnaire (see Appendix 3A) was designed for directors and managers of the selected health services facilities. Its purpose was to assess institutional knowledge of the organization and integration of health services at the first level of care, coordination with the health system and the information used by staff to carry out HIV counseling in relation to improving the comprehensive provision of services for HIV/AIDS and associated infectious diseases.

The second questionnaire (see Appendix 3B), aimed at healthcare providers, assessed KAP regarding HIV/AIDS and associated infectious diseases. Providers were selected according to geographic area and whether they could potentially participate in the course and included physicians, nurses and health educators.

The third and final questionnaire (see Appendix 3C) was designed to collect information and opinions from health service users. Users were asked about their perception of the integration of services received for HIV, sexually transmitted infections (STIs) and sexual and reproductive health in general. The questionnaire also aimed to establish users' KAP regarding HIV and STIs.

All questionnaires were based on the academic proposal that PAHO/WHO, JHU and other participating institutions had developed for the general contents of the online course. The majority of the questionnaire consisted of closed questions so that results could be tabulated and analyzed more easily. All questionnaires were approved by each country's respective ethics committee.

Finally, the evaluation has additional input in the form of individual students' initial and final tests for each course component. This assessment is quantitative for the JHU and Gorgas courses, and both qualitative and quantitative for the PAHO course, since student reflections are built into the modules. These methodologies are detailed in subsequent sections on the course evaluations, and in Appendices 6 and 7.

3.2 Validation and adjustment of data collection instruments.

Baseline data collection instruments were validated and adjusted during over the course of two days in each participating country. Local team members started by visiting two pre-selected health centers not located in the department or province selected for the intervention. After applying the instruments the team reviewed the responses and discussed the content and understanding of the questions. Prior to commencing field work minor changes were made to the instruments, mainly editing and local language adaption.

3.3 Respondent sample selection.

The online and on-site course coordinators defined the course participant sample as 50 health workers per country, but provider participation in the baseline study was not conditioned on a random process. The course was aimed at similar communities in each participating country reflecting basic characteristics of an underserved community (described below). This allowed us to define the geographic area of interest and therefore all PHC facilities to be included. This process naturally created the baseline sample of all active

service providers within those pre-selected facilities, so it was not necessary to select among them. Assuming that not all local staff would be able to be interviewed for various reasons, the initial or baseline measurement was expected to include at least 90% of the previously defined population.

To estimate the effects on PHC service user attitudes and practices we performed exit interviews with users receiving some type of health service the day of the field visit. As recommended by Valadez[2] a random sample of 19 users in each participating facility was selected (see Appendix 2).

3.4 Selection of and field work at PHC facilities.

The target population of this intervention was clearly defined as underserved communities. Underserved populations are generally defined as groups whose demographic, geographic, or economic characteristics impede or prevent their access to health care services. All activities undertaken in this proposal were designed to focus on improving health service delivery to these disadvantaged populations. To identify similar intervention communities in the four participating countries, the following basic characteristics of interest for an underserved community were taken into consideration:

- ✓ Number of PHC facilities in each district
- ✓ Number of health service professionals (doctors, nurses, health educators)
- ✓ Availability of computer equipment or internet cafe in the selected health district
- ✓ Internet access
- ✓ Geographical accessibility
- ✓ Geographical category (could be an entire province/department, usually rural)
- ✓ Population group: indigenous communities within a defined geographic area
- ✓ High to moderate prevalence of HIV/AIDS and associated diseases
- ✓ 95% of online and on-site course participants: doctors and nurses from selected underserved communities interviewed at baseline
- ✓ 5 % of online and on-site course participants: other Ministry of Health staff

The following departments/provinces in each of the participating countries were selected according to these criteria and with input from the Ministries of Health, as described in the following section.

Country	Province/department selected
Guatemala	Escuintla
Nicaragua	Masaya
Panama	San Miguelito
Dominican Republic	Regions IV and V

In each of the four participating countries the field team participated in a coordination meeting with health center directors to establish a work plan for the health center visits. Information was requested on the number of staff directly providing care to patients as well as the estimated number of outpatient visits for each health center for the day planned for data collection. Directors were also asked to make available three closed-off areas to carry out the interviews, as well as the assistance of a staff member of the institution to identify health providers to be interviewed and also direct outpatient to the area where they would be interviewed. The health regions provided a list of staff by type, position and installation, each of whom was assigned a consecutive code. Staff members who were not included in the original listing were subsequently assigned a code.

1. **Valadez, Joseph.** 2003. **Assessing Community health Programs, A Trainer's Guide: Using LQAS for Baseline Surveys and Regular Monitoring**. TALC: Teaching Aids at Low Cost, St. Albans, United Kingdom.

Guatemala

The Ministry of Health selected the health department of Escuintla to participate in the online course. Participants included all service provision and health education staff in the department's 15 health centers and their associated health posts.

Table 4. Participating health centers: Escuintla, Guatemala

1	Centro de Salud Escuintla
2	Centro de Salud Guanagazapa
3	Centro de Salud Iztapa
4	Centro de Salud La Democracia
5	Centro de Salud La Gomera
6	Centro de Salud Masagua
7	Centro de Salud Nueva Concepción
8	Centro de Salud Palín
9	Centro de Salud Puerto San José
10	Centro de Salud San Vicente Pacaya
11	Centro de Salud Santa Lucía Cotzumalguapa
12	Centro de Salud Siquinalá
13	Centro de Salud Tiquisate
14	Centro de Salud Amatitlan, Guatemala Sur
15	Centro de Salud Villa Nueva, Guatemala Sur

Source: Baseline data collection, Guatemala.

As a result of several meetings held between CIESAR's technical team members, PAHO representatives and Ministry of Health officials, an inter-institutional technical team was formed to coordinate the course in Guatemala consisting of the Ministry's Comprehensive Health Care Unit, the National HIV/AIDS Program, the Ministry's Training Department and Research Unit and local representatives from the PAHO office.

Table 5. Participating health center by type of interview

	Facility	**Provider**	**Outpatient**
Escuintla	1	42	19
Guanagazapa	1	29	19
Iztapa	1	16	19
La Democracia	1	14	19
La Gomera	1	38	19
Masagua	1	19	19
Nueva Concepción	1	21	19
Palín	1	8	19
Puerto San José	1	27	19
San Vicente Pacaya	1	23	19
Santa Lucía Cotzumalguapa	1	25	19
Siquinalá	1	15	19
Tiquisate	1	41	19
Villa Nueva	1	2	19
Amatitlán	1	10	19
Total	**15**	**330**	**285**

Source: Baseline data collection, Guatemala.

Table 5 shows that 15 directors (one for each health center), 330 health service providers and 285 health service users completed questionnaires, for a total of 630 completed interviews in Guatemala.

Nicaragua

In conjunction with the local PAHO office, the Gorgas Memorial Institute and CIESAR, authorities from the Ministry of Health selected the Masaya Comprehensive Health Service System (SILAIS in Spanish) to participate in the online course, including all staff that provides health care and education at the primary care level. The sample of 10 selected health facilities also includes 32 health posts.

Table 6. Participating health centers: Masaya, Nicaragua

1	Masaya Sur (Monimbo)
2	Masaya Norte
3	La Concepción
4	Catarina
5	Masatepe
6	Nandasmo
7	Nindirí
8	San Juan de Oriente
9	Niquinohomo
10	Tisma

Source: Baseline data collection, Nicaragua.

To define the work plan and timeline, the field work team participated in a coordination meeting at Ministry of Health headquarters and subsequently visited the Masaya SILAIS office where, together with local authorities and directors of the North Masaya, Masaya Sur, La Concepción, Nandasmo and Masatepe health centers, explained the objectives of the visit and field work.

As shown in Table 7, the 311 completed questionnaires were distributed as follows: nine health center directors, 112 health service providers and 190 health service users.

Table 7. Participating health center by type of interview

	Facility	**Provider**	**Outpatient**
Masaya Sur (Monimbo)	1	21	19
Masaya Norte	1	25	19
La Concepción	1	15	19
Catarina	1	5	19
Masatepe	1	11	19
Nandasmo	1	11	19
Nindirí	0	6	19
San Juan de Oriente	1	3	19
Niquinohomo	1	11	19
Tisma	1	4	19
TOTAL	**9**	**112**	**190**

Source: Baseline data collection, Nicaragua.

Panama

Ministry of Health authorities, together with the local PAHO office, the Gorgas Memorial Institute and CIESAR, selected Region 8-San Miguelito to participate in the online courses. The sample includes

staff that provides health care and education to users of health services across all 13 health centers and sub-centers.

Table 8. Participating health centers: San Miguelito, Panama

1	C. DE S. AMELIA DENIS DE ICAZA
2	C. DE S. SAN ISIDRO
3	C. DE S. DON BOSCO
4	C. DE S. CERRO BATEA
5	C. DE S. NUEVO VERANILLO
6	C. DE S. TORRIJOS CARTER
7	C. DE S. VALLE DE URRACA
8	SUB C. DE S. CAIMITILLO
9	C. DE S. ALCALDE DIAZ
10	SUB C. DE S. AGUA BUENA
10	C. DE S. CHILIBRE
12	C. DE S. ROMULO ROUX
13	ULAPS LAS CUMBRES

Source: Baseline data collection, Panama.

A total of 482 questionnaires were completed as follows: 13 by health center directors, 222 by health personnel and 247 by health service users.

Table 9. Participating health center by type of interview

	Facility	Provider	Outpatient
C. DE S. AMELIA DENIS DE ICAZA	1	18	19
C. DE S. SAN ISIDRO	1	25	19
C. DE S. DON BOSCO	1	3	19
C. DE S. CERRO BATEA	1	15	19
C. DE S. NUEVO VERANILLO	1	31	19
C. DE S. TORRIJOS CARTER	1	19	19
C. DE S. VALLE DE URRACA	1	14	19
SUB C. DE S. CAIMITILLO	1	6	19
C. DE S. ALCALDE DIAZ	1	17	19
SUB C. DE S. AGUA BUENA	1	5	19
C. DE S. CHILIBRE	1	19	19
C. DE S. ROMULO ROUX	1	28	19
ULAPS LAS CUMBRES	1	22	19
TOTAL	**13**	**222**	**247**

Source: Baseline data collection, Panama.

Dominican Republic

Ministry of Health authorities, together with the local PAHO office, the Gorgas Memorial Institute and CIESAR, selected Region V to participate in the online courses. The sample includes all staff providing health care and education to users of all primary care health services in the provinces of Altagracia and La Romana. The Dominican Institute for the Study of Comprehensive Health and Applied Psychology (IDESIP in Spanish) was selected to coordinate field work in these provinces. IDESIP and CIESAR staff visited Regional V Ministry of Public Health headquarters located in the Province of San Pedro de Macorís. The meeting was also attended by area coordinators and managers of the targeted provinces.

Table 10. Participating health facilities: Altagracia and La Romana, Dominican Republic

1	La Calea
2	Isla Saona
3	Clinica Familiar Mir
4	Centro Luis J. Suarez
5	Padre Cabaloto
6	Los Mulos III
7	Cucama
8	Kilometro 10
9	Kilometro 14
10	Oficina Provincia
11	Vista Hermosa
12	Villa Hersosa
13	Boca de Yuma
14	La Guazuma
15	Magdalena
16	Bayahibe
17	Boca de Chavon
18	Las Eneas
19	Hato de Mana
20	Los Cerritos
21	Guaniabano
22	Politur
23	El Salado
24	Blandino
25	El Bonao
26	Las Guamas
27	Cañan La Honda
28	El Peñon
29	Veron *
30	Mata Chalupe
31	La llanada del Ceno
32	La Otra Banda
33	Los Guineos
34	Mama Tingó
35	Pepe Rosario
36	San Francsico
37	Juan Pablo Duarte
38	La Malena
39	Los Platinitos*
40	Villa Cerro
41	Carcel Publica
42	Los Rosales
43	La Florida
44	Los Sotos
45	San Martin
46	San Pedro
47	Gerencia Provincial de Salud
48	Santana
49	Bemerito
50	Los Negros

Source: Baseline data collection, Dominican Republic.

Table 11 presents the distribution of the 310 questionnaires completed: seven health facility administrators, 84 health services personnel and 219 health service users were interviewed.

Table 11. Participating health center by type of interview

	Facility	Provider	Outpatient
La Calea		2	7
Isla Saona		0	0
Clinica Familiar Mir		2	7
Centro Luis J. Suarez		8	
Padre Cabaloto		1	5
Los Mulos III		2	5
Cucama		2	5
Kilometro 10		2	5
Kilometro 14		1	5
Oficina Provincia	3		
Vista Hermosa		5	7
Villa Hersosa		1	7
Boca de Yuma		1	5
La Guazuma		2	5
Magdalena		1	5
Bayahibe		2	5
Boca de Chavon		1	5
Las Eneas		2	5
Hato de Mana		1	5
Los Cerritos		2	5
Guaniabano		2	1
Politur		2	5
El Salado		2	5
Blandino		1	5
El Bonao		1	5
Las Guamas		2	4
Cañan La Honda		1	6
El Peñon		1	5
Veron *		4	7
Mata Chalupe		2	5
La llanada del Ceno		1	5
La Otra Banda		2	7
Los Guineos			4
Mama Tingó		2	3
Pepe Rosario		2	3
San Francsico		2	3
Juan Pablo Duarte		2	3
La Malena			3
Los Platinitos*		2	3
Villa Cerro		2	7
Carcel Publica		2	5
Los Rosales			5
La Florida		2	3
Los Sotos		2	3
San Martin		2	3
San Pedro		2	3
Gerencia Provincial de Salud	**4**		
Santana		1	5
Bemerito		1	5
Los Negros		1	5
Total	**7**	**84**	**219**

Source: Baseline data collection, Dominican Republic.

3.5 Response rate and nonresponse error.

Table 12 presents the total sample for the baseline phase by country and number of health center, provider and users interviewed. The number of planned baseline interviews were carried out in all participating countries except in Nicaragua, where only 112 (70%) of the 160 scheduled provider interviews were carried out. There were four rejections (2.5%) and 24 (15%) interviewees were unable to complete an interview due to vacation, leave, or illness. Table 12 also shows the error rate by type of questionnaire and country. Problems were detected for 3% of questionnaires, mainly for range errors or transcription issues, but all questionnaires were corrected prior to final entry.

Table 12. Distribution of completed questionnaires, response rate and errors

Province or Department	Institutional	Provider	Outpatient	Total	Error Frecuency	% Errors
Escuintla, Guatemala	16	350	287	632	10	2%
San Miguelito, Panama	14	232	247	483	9	2%
Masaya, Nicaragua	10	112	190	312	5	2%
Region V, Dominican Republic	7	84	219	305	28	9%
Total	**47**	**794**	**943**	**1,732**	**52**	**3%**

3.6 Data entry.

Data from all four countries was collected through instruments given to users, health service providers and managers and subsequently entered into the EPI INFO software DOS version 6.04d.[3]

For each of the three instruments (user, provider and facility director), an income structure was generated (QES files), along with a file to control data entry programming errors (CHK files) such as entry of values or codes outside the ranges established for the study. This was done by establishing minimum or maximum values for variables, and only allowed valid values for binary codes such as the sex of the respondent.

In addition to the data control quality files we performed double data entry in order to identify any possible typing errors through a validation process that contrasts both entries. Therefore the double entry files were validated and identified errors were corrected. The process of file validation and correction was performed as many times as necessary to achieve 0% errors.

4. Analysis of baseline information

EPI INFO was also used for variable construction and information analysis. Given the baseline's objective of characterizing the actual or initial state of the indicators, the statistical analysis was purely descriptive.

Macro-indicators were constructed from combining the answers to several key questionnaire topics (see Appendix 4 for an explanation of all indicators). For example, to assess health provider knowledge about HIV transmission and prevention, we used the responses to five basic knowledge questions from the health provider questionnaire; all five questions had to answered correctly to count towards the *HIV transmission and prevention knowledge* macro-indicator. This also created a weighted index ranging from 0 to 100 points, which then allowed us to quantitatively rank health personnel and users by knowledge.

Macro-indicators and weighted indexes were also constructed with responses obtained from questionnaires in the following categories: *Existence and knowledge of integrated health services for HIV* (health facility questionnaire only), *Vertical transmission prevention*, *HIV and VDRL testing and counseling*, *Presence of*

[3] EPI INFO es un software libre de licencias, que fue creado y es distribuido gratuitamente por el Centro de Control de Enfermedades de Atlanta, USA (CDC). WWW.CDC.GOV

stigma (health provider and user questionnaires only) and *Quality of HIV services* (health facility questionnaire only). Only closed questions and questions with a codeable answer option were used for the construction of macro-indicators and indexes.

5. Baseline evaluation findings

5.1 Questionnaire respondent profile.

Appendix 5 contains all variables, characteristics and responses for each of the three types of respondents by participating country. Below we summarize the profile of the total sample comprising all four countries.

Across the four countries, nearly a third of PHC service providers participating in the distance learning course were 31 to 40 years old (29.1%), and nearly half (49.3%) of respondents were over the age of 40. The majority of the sample was female (76%) and Catholic (62.5%). Forty-one percent had obtained a higher education degree and 13% had completed post-graduate work. The most highly represented professions among respondents were doctor (30.4%) and nursing assistant (25.6%) followed by licensed nurse (13.9%).

Nearly half of the PHC services users interviewed were 18 to 30 years old (47%) and the majority were female (83.2%) and housewives (62.2%). In terms of religion, most were either Catholic (45.7%) or Evangelical (38%). Elementary school was the most common educational level completed (30.8%) and nearly a quarter (23.9%) had not completed or never enrolled in elementary school.

The vast majority of PHC facility directors or managers were between 31 and 50 years old (76.6%). More than half were female (57.4%) and Catholic (68.1%). Sixty-six percent had obtained a higher education degree and the remaining 34% had completed post-graduate training. Health manager was the most common profession (44%) and nearly three quarters (74.5%) had been working in their respective facility for less than three years.

5.2 Knowledge of HIV transmission, prevention and control.

As described above and in Appendix 4, we constructed a macro-indicator to determine the minimal amount of knowledge that health providers should have on modes of transmission and prevention and treatment of HIV/AIDS and RIDs. To garner a macro-indicator score respondents had to know all five answers.

Health provider knowledge

As Table 13 shows, none of the health service providers or health educators in any of the participating countries answered all five macro-indicator questions on HIV transmission, prevention and treatment correctly. When the macro-indicator was disaggregated to calculate the weighted average — i.e., respondents knew at least one, but not all, of the answers — we observed very similar results between countries, around 50 on a scale of 0 to 100.

Table 13. Health professionals' knowledge of HIV transmission, prevention and treatment in four countries

	Number of health professionals interviewed	Knowledge macro-indicator[1] achieved	Weighted average[2]
Guatemala	350	0	47.56
Panama	232	0	45.01
Nicaragua	128	0	51.98
Dominican Republic	84	0	52.25

[1] Must know all of the following: HIV transmission modes, childbirth mode (vaginal vs. cesarean) matters for mother-to-child HIV transmission, the VDRL test is part of routine prenatal care, syphilis can be transmitted from mother to newborn, HIV is a retrovirus,

Elisa and Western Blot are used to diagnose HIV, how to assess contacts, discard OI, assess immune status, decide if ART is necessary, which kind of ART, CD4 knowledge, retroviral teratogenicity.

[2] Index of 0 to 100 points calculated via a weighted average of all macro-indicator components.

Results for other indicators of providers' KAP regarding HIV and related diseases are presented in Table 14 and categorized as satisfactory, intermediate or unsatisfactory.

Table 14. KAP of health professionals for HIV and associated diseases, number(%)

	GUA (n=350)	NIC (n=128)	PAN (n=232)	DR (n=84)
Satisfactory KAP (100 % - 80%)				
Knows the VDRL test is part of routine prenatal care	338 (96.6)	128 (100)	232 (100)	84 (100)
Takes biosecurity measures during patient exams	229 (97.0)	108 (90.8)	163 (88.6)	34 (87.2)
Would treat an HIV-positive person	346 (98.9)	128 (100)	230 (99.1)	84 (100)
Believes that access to health care services is a human right	344 (98.3)	128 (100)	232 (100)	81 (96.4)
Knows about vertical HIV transmission	321 (91.7)	113 (88.3)	154 (66.4)	76 (90.5)
Knows that syphilis can be transmitted from mother to newborn	327 (93.4)	123 (96.1)	216 (93.1)	81 (96.4)
Willingness to take an HIV test at the moment of questionnaire	334 (95.4)	124 (96.9)	226 (97.4)	82 (97.6)
Mentions that childbirth mode (vaginal vs. cesarean) matters for mother-to-child HIV transmission	321 (91.7)	113 (88.3)	154 (66.4)	76 (90.5)
Mentions opportunistic respiratory infections affecting HIV-infected people	313 (89.4)	56 (43.8)	193 (83.2)	81 (96.4)
Orders HIV tests for patients with risky behavior	206 (83.1)	115 (95.8)	98 (53.8)	33 (84.6)
Intermediate KAP (79% - 51 %)				
Mentions that over 50% of perinatal HIV transmission occurs during labor	273 (78.0)	84 (65.6)	106 (45.7)	71 (84.5)
Mentions having sexual relations with one stable partner	273 (78.0)	108 (84.4)	197 (84.9)	68 (81.0)
Recognizes that the ELISA and Western Blot tests are specific to HIV diagnosis	265 (75.7)	117 (91.4)	173 (74.6)	77 (91.7)
Has been tested for HIV test in the last 3 years	265 (75.7)	105 (82.0)	145 (62.5)	66 (78.6)
Mentions not having sexual relations with more than one partner	220 (62.9)	82 (64.1)	101 (43.5)	56 (66.7)
Recognizes that HIV belongs to the retrovirus family	193 (55.1)	92 (71.9)	128 (55.2)	71 (84.5)
Unsatisfactory KAP (50 % - 0%)				
Recognizes that HIV is a retrovirus and knows specific diagnostic laboratory tests	166 (47.4)	82 (64.1)	100 (43.1)	69 (82.1)
Uses preventive methods for HIV and STIs in sexual relations	166 (47.4)	79 (61.7)	124 (53.4)	45 (53.6)
Knows to initiate treatment when CD4 count is less than or equal to 350 cells/mm^3	102 (29.1)	42 (32.8)	51 (22.0)	35 (41.7)
Mentions that the majority of retrovirals are not teratogenic	87 (24.9)	34 (26.6)	56 (24.1)	16 (19.0)
Always uses condoms in all sexual relations	78 (22.3)	32 (25.0)	31 (13.4)	8 (9.5)
Mentions the lack of risk of acquiring HIV at work	67 (19.1)	11 (8.6)	71 (30.6)	30 (35.7)
Knows the groups of antiretrovirals used in HIV treatment	46 (13.1)	47 (36.7)	88 (37.9)	35 (41.7)
Knows at least one group of antiretrovirals	20 (5.7)	2 (1.6)	42 (18.1)	14 (16.7)
Knows how to proceed when assessing a person at-risk for or diagnosed with HIV	10 (2.9)	9 (7.0)	9 (3.9)	2 (2.4)
Knows the three ways to transmit HIV[1]	5 (1.4)	1 (0.8)	1 (0.4)	0 (0)
Knows aspects of ART	3 (0.9)	1 (0.8)	8 (3.4)	2 (2.4)
Mentions 4 of the 6 influential social determinants in the HIV epidemic	0 (0)	0 (0)	0 (0)	0 (0)
Mentions 3 of the 5 most important actions in assessing an HIV infected person	0 (0)	0 (0)	0 (0)	0 (0)

[1] Sex, blood and perinatal.

Health service user knowledge

The macro-indicator for users of outpatient PHC services is based on their knowledge of HIV/AIDS and associated infectious diseases and how they are transmitted and prevented. Respondents achieved the full knowledge macro-indicator when they correctly answered all questions, thus demonstrating basic knowledge of HIV and RIDs.

As Table 15 shows, a low number of outpatients demonstrated overall knowledge of HIV and RIDs transmission, though results varied by country. Nearly 10% of respondents answered all the questions correctly in the Dominican Republic, compared with only 3.4% in Nicaragua. However, for the disaggregated values indicating partial knowledge, the lowest score was observed in Guatemala (slightly less than 60 on a scale of 0 to 100) and the highest in Panama (nearly 71).

Table 15. Outpatient knowledge of HIV transmission in four countries

	Number of outpatients interviewed	Knowledge macro-indicator achieved (% of users) [1]	Weighted average[2]
Guatemala	326	16 (4.9)	59.59
Panama	262	18 (6.9)	70.78
Nicaragua	203	7 (3.4)	63.20
Dominican Republic	219	21 (9.6)	68.54

[1] Must know all of the following: HIV can be transmitted from mother to newborn, labor is when HIV is transmitted, HIV positive women should not breastfeed, AIDS is incurable, knows about syphilis, genital herpes and HIV.
[2] Index of 0 to 100 points calculated via a weighted average of all macro-indicator components.

Other indicators of outpatient knowledge regarding HIV/AIDS and STIs are presented in Table 16. Approximately three-quarters of respondents in all four countries correctly responded that AIDS cannot be cured. On the other hand, Dominican respondents were far more knowledgeable about vertical transmission, while Panamanian respondents knew the most about HIV and STIs in general.

Table 16. Outpatient knowledge of HIV and associated diseases, number(%)

	GUA (n=326)	**NIC (n=203)**	**PAN (n=262)**	**DR (n=219)**
Knows about vertical transmission of HIV	37 (11.30)	9 (4.4)	30 (11.5)	138 (63.0)
Knows that AIDS is incurable	255 (78.2)	161 (79.3)	200 (76.3)	163 (74.4)
Knows about HIV and STIs	86 (26.4)	73 (36.0)	160 (61.1)	66 (30.1)

Facility director knowledge of health services integration

The macro-indicator constructed from responses to the PHC facility administrator questionnaire was designed to determine the amount of knowledge that directors and managers have regarding the integration of health care services for HIV/AIDS and RIDs. To garner a macro-indicator score respondents had to respond affirmatively all of the questions related to the integration of services for HIV patients.

The following table shows the results of the responses given by the health service directors in each country of study. None of the directors could respond affirmatively to all of the questions related to minimal integration of services for HIV/AIDS and prevalent diseases; in other words when asked about ***services offered*** in their institution, none responded affirmatively.

Table 17. Directors reporting that HIV and RIDs services are integrated

	Number of PHC facility directors interviewed	Integration knowledge macro-indicator achieved[1]
Guatemala	16	0
Panama	14	0
Nicaragua	10	0
Dominican Republic	7	0

[1] Answer must be affirmative for "facility offers": HIV test, HIV counseling and condoms and takes vertical prevention measures.

When health service directors were asked to ***affirm that the facility services are integrated*** for various HIV and RIDs related services, once again none of the directors could respond affirmatively to all of the questions, indicating that HIV services are not integrated for the variables included in the study.

Table 18. Directors affirming that HIV and RIDs services are integrated

	Number of PHC facility directors interviewed	Number of PHC facilities affirming the integration of services[1]
Guatemala	16	0
Panama	14	0
Nicaragua	10	0
Dominican Republic	7	0

[1] Answer must be affirmative for "facility services are integrated" for: HIV testing, HIV counseling, condom distribution and vertical prevention measures.

On the other hand, the following table shows the response given when asked if they facility they directed met the definitions given by PAHO/WHO regarding a comprehensive and integrated facility. According to this definition, an integrated health service facility takes advantage of all available opportunities to educate, counsel, test and treat all patients, including in the provision of sexual, reproductive and HIV/STI health services. All of the managers/directors interviewed in Nicaragua considered their services to be both comprehensive and integrated, while Panama had the lowest proportion (28.6%) of respondents that agreed with this statement.

Table 19. Directors affirming that PHC facility services are comprehensive and integrated

	Number of PHC facility directors interviewed	Number (%) of directors affirming that the PHC facility services are comprehensive and integrated
Guatemala	16	11 (68.8)
Panama	14	4 (28.6)
Nicaragua	10	10 (100)
Dominican Republic	7	5 (71.4)

Facility directors were also asked if patients receiving HIV related services at the facility were offered additional services, with this indicator defined as an affirmative response to several questions. As shown in the following table, all respondents in Guatemala and Nicaragua said that their facility offered additional services to patients receiving HIV related services. For Panama and the Dominican Republic proportions were also high: 92.9% and 85.7%, respectively.

Table 20. Directors affirming patients receiving HIV related services at the facility are offered additional services

	Number of PHC facility directors interviewed	Number (%) of directors affirming that the PHC facility offers additional services [1]
Guatemala	16	16 (100.0)
Panama	14	13 (92.9)
Nicaragua	10	10 (100)
Dominican Republic	7	6 (85.7)

[1] Includes: family planning services, STI prevention and management, maternal infant health services, gender-based violence prevention and management, unsafe abortion prevention and post abortion care, reproductive health services and services offered in the same area and by the same provider.

Other indicators of health care services integration regarding HIV/AIDS and STIs as reported by interviewed PHC facility administrators are presented in Tables 21-23. In Nicaragua, Panama and Dominican Republic no directors said vertical transmission practices were in effect and only 25% of Guatemalan respondents did so (Table 21). For condom distribution, affirmative responses were rare in Panama and nonexistent in the other three countries. Larger proportions of respondents said their facilities offered HIV testing and counseling.

Table 21. Directors affirming that their facility offers HIV and RIDs services, number (%)

	GUA (n=16)	**NIC (n=10)**	**PAN (n= 14)**	**DR (n=7)**
HIV testing offered	8 (50.0)	9 (90.0)	10 (71.4)	4 (57.1)
HIV counseling offered	8 (50.0)	9 (90.0)	10 (71.4)	3 (42.9)
Condoms distributed	0 (0.0)	0 (0.0)	1 (7.1)	0 (0.0)
Vertical transmission prevention in effect	4 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)

When asked whether their facility's HIV and RIDs services also offered Gender-based violence prevention and management, unsafe abortion prevention and post abortion care, no director from any country responded affirmatively. Thirty percent of Nicaraguan respondents and 21% of Panamanian respondents, but none from Guatemala or Dominican Republic, said that maternal infant health and HIV services were offered jointly. STI prevention and management services are rarely integrated, but family planning services sometimes are: between 14% (in Panama) and 81% (in Guatemala) responded affirmatively.

Table 22. Directors who believe that their facility's HIV and RIDs services offer: number (%)

	GUA (n=16)	**NIC (n=10)**	**PAN (n= 14)**	**DR (n=7)**
Family planning and HIV services are integrated	13 (81.3)	4 (40.0)	2 (14.3)	3 (42.9)
STI prevention and management and HIV services are integrated	0 (0.0)	0 (0.0)	2 (14.3)	0 (0.0)
Maternal infant health and HIV services are integrated	0 (0.0)	3 (30.0)	3 (21.4)	0 (0.0)
Gender-based violence prevention and management and HIV services are integrated	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Unsafe abortion prevention and post abortion care and HIV services are integrated	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 23. Directors' perception of their facility's HIV and RIDs services, number (%)

	GUA (n=16)	NIC (n=10)	PAN (n= 14)	DR (n=7)
Mentions the following as essential (priority) HIV services:				
HIV test with counseling	8 (50.0)	9 (90.0)	10 (71.4)	3 (42.9)
HIV test without counseling	0 (0.0)	0 (0.0)	0 (0.0)	1 (14.3)
Condom distribution	0 (0.0)	0 (0.0)	1 (7.1)	0 (0.0)
Vertical transmission prevention	4 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mentions that the HIV test is one of the laboratory exams offered during prenatal care	16 (100)	10 (100)	14 (100)	5 (71.4)
Mentions that the facility refers users who must be treated elsewhere	16 (100)	10 (100)	14 (100)	4 (57.1)
Mentions that the facility has a follow up system to verify referrals	12 (75.0)	10 (100)	11 (78.5)	4 (57.1)
Mentions that the facility performs follow up via:				
Referral and counter-referral system	4 (25.0)	6 (60.0)	10 (71.4)	3 (42.9)
Accompaniment	1 (6.3)	1 (10.0)	1 (7.1)	0 (0)
Other type of system	8 (50)	3 (30.0)	0 (0)	1 (14.3)
Mentions that the facility does not perform follow up due to:				
Over-saturation of health workers	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Follow up is unnecessary	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Users return of their own accord	0 (0.0)	0 (0.0)	1 (7.1)	0 (0.0)
Lack of a referral and counter-referral system	4 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)
Other reason	1 (6.3)	0 (0.0)	1 (7.1)	0 (0.0)
Mentions that there are no limitations in comprehensive service delivery	2 (12.5)	6 (60.0)	1 (7.1)	2 (28.6)

PHC service users were also asked questions related to integrated services. As Table 24 shows, few respondents believed that HIV-positive women should get pregnant. The proportion of respondents who said they received HIV and/or VDRL testing when pregnant varied substantially: self-reported prenatal HIV testing ranged from as low as 20.5% in the Dominican Republic to as high as 66% in Panama, while VDRL testing ranged from 8.9% in Nicaragua to 60.7% in Panama.

Table 24. PHC users' perception of the integration of HIV and RIDs services, number (%)

PHC users who:	GUA (n=326)	NIC (n=203)	PAN (n= 262)	DR (n=219)
Believe that a woman with HIV has the right to get pregnant	26 (8.1)	51 (25.1)	47 (7.9)	23 (10.5)
Had been tested for HIV during prenatal care	143 (44.7)	83 (40.9)	173 (66.0)	45 (20.5)
Had been given the VDRL test during prenatal care	127 (39.7)	18 (8.9)	159 (60.7)	45 (20.5)

5.3 Vertical transmission knowledge.

This macro-indicator characterizes knowledge on issues related to mother-to-child transmission of HIV and RIDs. Like the previous macro-indicator, respondents had to respond affirmatively to all questions related to vertical transmission of HIV.

Health provider knowledge of vertical transmission of HIV

The following table shows the response of health professionals when asked about the need to include HIV testing as part of the laboratory tests offered to pregnant women. Of all the countries, Nicaragua had the largest proportion of doctors and nurses who claim that HIV testing is offered with laboratory tests during

prenatal care (98.4%), and to a lesser extent in Panama and the Dominican Republic with 76.7% and 90.5%, respectively. In Guatemala less than 3% of health professionals affirm that this test is part of prenatal laboratory tests.

Table 25. Health professionals demonstrating knowledge of vertical transmission of HIV

	Number of health professionals interviewed	Number (%)of health professionals who affirm that HIV testing is offered with prenatal laboratory tests[1]
Guatemala	350	10 (2.9)
Panama	232	178 (76.7)
Nicaragua	128	126 (98.4)
Dominican Republic	84	76 (90.5)

[1] Answer must be affirmative for: HIV testing offered during prenatal care.

Outpatient knowledge of vertical transmission of HIV

This macro-indicator was created to determine population consciousness regarding issues related to vertical transmission of HIV. To fulfill this macro-indicator respondents had to respond affirmatively to all questions related to vertical transmission, including whether they had received HIV test results during their during prenatal care. Table 25 shows that for women who had been pregnant, the greatest proportion responding affirmatively to all the questions were in the Dominican Republic (60.9%), followed by women in Nicaragua (41.2%), Panama (27.3%) and finally, Guatemala (22.6%).

Table 26. Outpatients demonstrating knowledge of vertical transmission of HIV

	Number of outpatients interviewed	Number (%) of previously pregnant women who affirm various aspects related to the prevention of vertical transmission of HIV[1]
Guatemala	301	68 (22.6)
Panama	220	60 (27.3)
Nicaragua	136	56 (41.2)
Dominican Republic	64	39 (60.9)

[1] Answer must be affirmative for: given HIV counseling, tested for HIV, and received test results during prenatal care.

The following table presents all three indicators of knowledge of HIV transmission among formerly pregnant respondents.

Table 27. Formerly pregnant outpatients who say they were offered services related to the prevention of vertical transmission of HIV, number (%)

Women who affirm they:	**GUA (n=326)**	**NIC (n=203)**	**PAN (n= 262)**	**DR (n=219)**
Were given HIV counseling	81 (24.8)	75(36.9)	67 (25.6)	71 (32.4)
Were tested for HIV	146 (44.8)	83 (40.9)	173 (66.0)	45 (20.5)
Received HIV test results	167 (51.2)	95 (46.8)	179 (68.3)	76 (34.7)

Facility director knowledge of vertical transmission of HIV

The following table shows that 100% of PHC facility directors interviewed in Guatemala, Panama and Nicaragua — but only 71.4% in the Dominican Republic — affirm that HIV testing is offered during prenatal care as a means of preventing vertical transmission of HIV.

Table 28. PHC facility directors demonstrating knowledge of vertical transmission of HIV

	Number of facility directors interviewed	Number (%) of directors who affirm that HIV testing is offered during prenatal care to prevent vertical transmission[1]
Guatemala	16	16 (100.0)
Panama	14	14 (100.0)
Nicaragua	10	10 (100.0)
Dominican Republic	7	5 (71.4)

[1] Answer must be affirmative for: Facility offers HIV testing during prenatal care.[1]

5.4 Knowledge of HIV and RIDs counseling services.

To fulfill this knowledge macro-indicator, respondents had to respond affirmatively to all questions related to HIV and RIDs counseling.

Health provider knowledge of counseling services

Less than 50% of physicians and nurses in the sample in every country considered VDRL and HIV counseling to be important. Nicaragua had the largest proportion of respondents (48.4%) who agreed that counseling given to pregnant women should include the importance of HIV and VDRL testing.

Table 29. Health professionals demonstrating knowledge of issues related to HIV counseling services

	Number of health professionals interviewed	Number (%)of health professionals who consider HIV and/or VDRL counseling during prenatal care to be important [1]
Guatemala	350	146 (41.7)
Panama	232	81 (34.9)
Nicaragua	128	62 (48.4)
Dominican Republic	84	27 (32.1)

[1] Answer must be affirmative for: Counseling during prenatal care should convey the importance of HIV and VDRL testing.

Health service user knowledge of counseling services

In assessing outpatients' overall knowledge of HIV and/or VDRL testing and counseling, we observed that almost no one in the four countries have been offered these services. Only in the Dominican Republic did PHC service users say they had received these services, but even this proportion was only 1.4%.

Table 30. Outpatients demonstrating knowledge of counseling services

	Number of outpatients interviewed	Number (%) of outpatients who mention the importance of HIV and/or VDRL counseling during prenatal care [1]
Guatemala	326	0 (0.0)
Panama	262	0 (0.0)
Nicaragua	203	0 (0.0)
Dominican Republic	219	3 (1.4)

[1]Answer must be affirmative for: given HIV counseling when tested for HIV and/or VDRL, and was advised about using condoms, HIV prevention and testing, prevention of syphilis transmission from mother to child, ART and HIV patient support.

The following table presents each indicator of knowledge of counseling services among outpatient respondents.

Table 31. Formerly pregnant outpatients who say they were offered HIV and/or VDRL counseling, number (%)

Respondents who affirm they:	GUA (n=326)	NIC (n=203)	PAN (n= 262)	DR (n=219)
Were tested for HIV and received counseling	1 (0.3)	0(0.0)	0 (0.0)	3 (1.4)
Were advised about prevention and transmission issues[1]	11 (3.4)	9 (4.4)	3 (1.1)	98 (44.7)
Were tested for HIV and/or syphilis and received counseling (women only)	85/170 (50)	77/104 (74)	67/188 (35.6)	76/77 (34.7)
Would have liked to have received the HIV and/or VDRL test with counseling (unmet demand in counseling and testing)	1 (0.3)	0 (0.0)	0 (0.0)	1 (0.5)

[1] Was advised about using condoms, HIV prevention and testing, prevention of syphilis transmission from mother to child, ART and HIV patient support.

PHC facility director knowledge of counseling services

Directors of participating facilities were asked about the availability of counseling services for HIV testing, provision of other reproductive health services with HIV testing and whether there was a staff member dedicated to counseling as well as educational materials used in counseling sessions. In Nicaragua 80% of respondents said their facilities met all of these requirements, followed by 50% in Guatemala, 43% in Panama and 29% in the Dominican Republic.

Table 32. PHC facility directors who affirm that HIV and/or VDRL counseling services are available in their facility

	Number of facility directors interviewed	Number (%) of directors who affirm that HIV and/or VDRL counseling services are available in their facility[1]
Guatemala	16	8 (50.0)
Panama	14	6 (42.9)
Nicaragua	10	8 (80.0)
Dominican Republic	7	2 (28.6)

[1] Answer must be affirmative for: HIV counseling is offered with the test, people being tested for HIV are offered other reproductive health services and existence of a health services counselor. Must show educational material used in counseling.

Table 33 shows the responses to individual questions regarding counseling services.

Table 33. Counseling services offered and characteristics of PHC facility counseling, number (%)

Respondents who affirm that:	**GUA (n=16)**	**NIC (n=10)**	**PAN (n= 14)**	**RD (n=7)**
The integrated PHC facility offers HIV testing with counseling	8 (50)	9(90)	10 (71.4)	3 (42.9)
Recipients of HIV testing with counseling are offered an additional service	15 (93.8)	9 (90)	8 (57.1)	4 (57.1)
The facility has a staff member dedicated to counseling	16 (100)	10 (100)	14 (100)	6 (85.7)
Counseling is given in an appropriate environment	15 (93.8)	9 (90.0)	14 (100)	2 (28.6)
Quality of counseling environment, assessed via observation				
Conversations cannot be heard from outside	16 (100)	10 (100)	14 (100)	7 (100)
Patients cannot be seen from outside	16 (100)	10 (100)	14 (100)	7 (100)
Counseling sessions are not interrupted	16 (100)	10 (100)	14 (100)	7 (100)
Counseling sessions are individual	16 (100)	10 (100)	1 (92.9)	2 (28.6)

5.5 HIV-related stigma.

This series of indicators evaluated stigma toward people infected with HIV among PHC providers and users. To be characterized as a person WITHOUT stigma, respondents had to respond affirmatively to each macro-indicator question.

Health provider stigma

As the following table shows, the HIV stigma of health professionals varied significantly by country. When asked if they would treat a person with HIV and take an HIV test themselves, 52.4% of health professionals from the Dominican Republic responded affirmatively to both questions, in contrast with only 6.3% of respondents in Nicaragua. In Guatemala and Panama 31.4% and 19.8% of respondents, respectively, do not show signs of HIV-related stigma.

Table 34. Health professional stigma toward people infected with HIV

	Number of health professionals interviewed	Number (%)of health professionals who manifest NO stigma toward HIV-infected people[1]
Guatemala	350	110 (31.4)
Panama	232	46 (19.8)
Nicaragua	128	8 (6.3)
Dominican Republic	84	44 (52.4)

[1] Answer must be affirmative for: (with adequate protection) would not have a problem with performing diagnostic and therapeutic activities with an HIV-positive patient, and would be tested for HIV.

Of the individual indicators of HIV-related stigma presented below, the biggest issue among health professionals in all four countries is their concern with being infected with HIV at work.

Table 35. Aspects of health professional stigma toward people infected with HIV, number (%)

Health professionals who say they:	**GUA (n=350)**	**NIC (n=128)**	**PAN (n=232)**	**DR (n=84)**
Would treat a person with HIV	346 (98.9)	128 (100)	230 (99.1)	84 (100)
Have no risk of acquiring HIV at work	62 (19.1)	11 (8.6)	71 (30.6)	30 (35.7)
Would be willing to take an HIV test	334 (95.4)	124 (96.9)	226 (97.4)	82 (97.6)

PHC user stigma

PHC users exhibit high rates of HIV-related stigma as measured by a compound indicator combining aspects of rejection toward HIV-infected people and willingness to take an HIV test. Only 1.4% of respondents in the Dominican Republic showed no HIV-related stigma, followed by 4.3% in Guatemala, 4.6% in Panama and nearly 10% in Nicaragua.

Table 36. PHC user stigma toward people infected with HIV

	Number of outpatients interviewed	Number (%) of outpatients who manifest NO stigma toward HIV-infected people[1]
Guatemala	326	14 (4.3)
Panama	262	12 (4.6)
Nicaragua	203	20 (9.9)
Dominican Republic	219	3 (1.4)

[1] Answer must be affirmative for: willing to take an HIV test and show NO type of rejection towards people with HIV (a woman with HIV has the right to get pregnant, an HIV infected teacher should be able to continue teaching, would care for a family member in advanced stages of HIV, would share a bathroom an HIV infected person and would allow their child to attend school with an HIV infected child).

Breaking down the compound indicator reveals that the majority of HIV-related stigma shown by PHC service users in all four countries can be attributed to rejection issues. Furthermore, in the Dominican Republic only 20% of respondents did not consider HIV to be punishment for bad behavior.

Table 37. Aspects of PHC user stigma toward people infected with HIV, number (%)

PHC users who:	**GUA (n=326)**	**NIC (n=203)**	**PAN (n= 262)**	**RD (n=219)**
Are willing to take an HIV test	268 (82.2)	164 (80.8)	232 (88.5)	197 (90.0)
Show NO type of rejection towards people with HIV[1]	15 (4.6)	23 (11.3)	12 (4.6)	4(1.8)
Consider HIV to be punishment for bad behavior	233 (71.5)	118 (58.1)	171 (65.3)	44 (20.1)

[1] A woman with HIV has the right to get pregnant, an HIV infected teacher should be able to continue teaching, would care for a family member in advanced stages of HIV, would share a bathroom an HIV infected person and would allow their child to attend school with an HIV infected child.

5.6 Service delivery improvement (quality of care) for HIV patients.

This series of indicators is based on PHC facility director and outpatient responses to questions about HIV and RIDs services, with the purpose of indirectly evaluating care improvement processes.

Facility directors' assessment of care improvement processes for HIV-infected patients

As an indicator of good quality, service managers were asked about the following aspects of HIV care delivery: that the facility has a good referral system for users who cannot be treated at the primary care level, all patients who test AFB positive for are tested for HIV, HIV testing is offered during prenatal care and the service has the necessary supplies to perform the test. While 100% of Nicaraguan service managers responded that their facilities complied with all criteria, only 57% did so in Panama, as did 19% of respondents in Guatemala and 14% in the Dominican Republic.

Table 38. PHC facility directors who believe their facility's HIV services are of good quality

	Number of facility directors interviewed	Number (%) of directors who affirm that HIV services are of good quality [1]
Guatemala	16	3 (18.8)
Panama	14	8 (57.1)
Nicaragua	10	10 (100)
Dominican Republic	7	1 (14.3)

[1] Answer must be affirmative for: the facility has a good referral system for users who cannot be treated at the primary care level, all patients who test AFB positive are tested for HIV, HIV testing is offered during prenatal care and the service has the necessary supplies to perform the test.

An analysis of the individual components of the quality macro-indicator shows that the majority of respondents in all countries believe their facility has a good referral system for users who cannot be treated at the primary care level.

Table 39. PHC facility directors who consider their facility to have a good referral system for HIV patients

	Number of facility directors interviewed	Number (%) of directors who consider their facility to have a good referral system for users who cannot be treated at the primary care level[1]
Guatemala	16	12 (75.0)
Panama	14	11 (78.6)
Nicaragua	10	10 (100.0)
Dominican Republic	7	4 (57.1)

[1] Answer must be affirmative for: the facility has a good referral system for users who cannot be treated at the primary care level and a good follow up system to verify referrals.

Responses to questions about prenatal HIV testing were more varied: less than a third of service managers in Guatemala and the Dominican Republic responded affirmatively, while more than three quarters of respondents in Panama affirmed that pregnant women are tested for HIV and that their facility has the necessary supplies to perform it.

Table 40. Availability of prenatal HIV testing at PHC facilities

	Number of facility directors interviewed	Number (%) of directors who affirm that HIV testing is offered during prenatal care and the facility has the necessary supplies to perform it[1]
Guatemala	16	5 (31.3)
Panama	14	11 (78.6)
Nicaragua	10	10 (100.0)
Dominican Republic	7	2 (28.6)

[1] Answer must be affirmative for: HIV testing is offered during prenatal care and the service has the necessary supplies to perform the test.

The following table presents the range of care improvement processes that PHC facility directors claim are in effect in their respective facilities.

Table 41. HIV care improvement processes affirmed by PHC facility directors, number (%)

PHC service directors who affirm that:	**GUA (n=16)**	**NIC (n=10)**	**PAN (n= 14)**	**DR (n=7)**
The facility refers users who cannot be treated at the primary care level	16 (100)	10 (100)	14 (100)	4 (57.1)
The facility has a follow up system to verify referrals	12 (75.0)	10 (100)	11 (78.6)	4 (57.1)
All patients who test AFB positive are tested for HIV	14 (87.5)	10 (100)	12(85.7)	4 (57.1)
HIV testing is offered during prenatal care	16 (100)	10 (100)	14 (100)	5 (71.4)
The facility has the necessary supplies to perform the test	5 (31.3)	10 (100)	11 (78.6)	2 (28.6)
The regional health service has issued and provided the facility with policies, rules and procedures concerning HIV and RIDs management	16 (100)	10 (100)	14 (100)	7 (100)
Shows that the facility possesses said policies, rules and procedures concerning HIV and RIDs management	15 (93.7)	7 (70.0)	14 (100)	2 (28.6)

PHC user assessment of care improvement processes for HIV-related services

The following table presents aspects of care improvement processes from the user's perspective. When asked whether they had been referred to another facility or different clinic than the one attended during this visit, 11.5% of PHC users responded affirmatively in Panama and 10.7% in Guatemala, with even lower proportions responding affirmatively in Nicaragua (2.5%) and Dominican Republic (5.9%). Regarding other services they would like to have received and issues raised during counseling, affirmative responses were rare with the exception of Dominican outpatients and HIV prevention counseling.

Table 42. Outpatient experiences with aspects of HIV-related care improvement, number (%)

PHC users who say they:	**GUA (n=326)**	**NIC (n=203)**	**PAN (n= 262)**	**DR (n=219)**
Had been referred to another facility or clinic other than the one they had just visited	35 (10.7)	5 (2.5)	30 (11.5)	13 (5.9)
Would have liked to have received another service such as:				
VDRL test with counseling	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.5)
VDRL test without counseling	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
HIV test with counseling	2 (0.6)	3 (1.5)	0 (0.0)	1 (0.5)
HIV test without counseling	4 (1.2)	3 (1.5)	1 (0.4)	2 (0.9)
Had been told about the following:				
Condom use to prevent HIV and STIs	1 (0.3)	0 (0.0)	1 (0.4)	1 (0.5)
HIV prevention	5 (1.5)	3 (1.5)	1 (0.4)	94 (42.9)
HIV testing	2 (0.6)	3 (1.5)	0 (0.0)	1 (0.5)
Prevention of mother-to-child HIV transmission	4 (1.2)	3 (1.5)	1 (0.4)	2 (0.9)
Prevention of mother-to-child syphilis transmission	1 (0.3)	2 (0.9)	1 (0.3)	2 (0.9)
That HIV is treated with anti retroviral therapy	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Care and support for people living with HIV	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

6. Evaluation of PAHO online course

A total of 180 health service providers and managers participated in the online course led by PAHO, distributed evenly among the four countries. The objective of this quantitative and qualitative evaluation was to determine to what extent the content of final essays improved (or did not improve) compared to essays initially prepared by the students prior to the start of the course. Only participants who turned in an initial or final essay via the online platform were included in the analysis.

Analytical matrices were developed according to the issues covered in the course: main social, political and economic factors influencing the HIV and RIDs; basic elements of the organization of HIV health care services; elements of integration of HIV prevention and promotion strategies in the maternal-infant health field; main clinical strategies and tools for the control of HIV and their implementation at the local level; and intervention and improvement proposals in all these areas. The themes of gender, ethnicity and discrimination and stigma were added as cross-cutting topics since they were addressed during the course and because they indicate awareness and changes in attitude. This exercise not only demonstrates the range of views expressed qualitatively by participants by way of paraphrasing or direct quotations (see Appendix 7), but also provides input for the scale developed to score the essays quantitatively.

The essay scoring system assigned 0 to 3 points in each of the five thematic areas depending on the author's level of analysis and ability to correlate ideas. Effort made to link responses to local experiences and HIV/AIDS care also counted toward the participant's score. The score assigned to each essay

was not intended to assess right or wrong answers, but rather to estimate their depth. For that reason the scale goes in ascending order (list, describe and analyze or relate), as shown below.

The course kicked off with a series of activities in which students learned to manage the platform and wrote their initial reflection. At the conclusion of the four week module on the integration of HIV and other prevalent diseases at the PHC level, participants wrote another essay. They were told content would be evaluated according to the thematic areas described below and given a checklist explaining aspects to include. Appendix 7 contains detailed results for each theme; the main pre-post results are summarized below.

Table 43. Analytical matrix and scoring system for essays

Theme	None = 0	Low = 1	Medium = 2	High = 3
Main factors influencing the social, political and economic environment	Fails to identify factors influencing the social, political and economic environment	Can identify at least one factor, but fails to explain the role of social determinants	Identifies factors and provides information on how they increase vulnerability, risk factors and barriers to health care access	Analyzes social determinants in relation to HIV
Basic elements of the organization of HIV health care services	Fails to mention how health system is organized (not just public health)	Indicates whether the health system is segmented, fragmented, equitable or not, but without any further explanation	Analyzes whether the health system corresponds to PHC and its degree of integration through networks (individual, family and community)	Analyzes the implications of the integration of HIV in PHC (as an integrated network)
Elements of integration of HIV prevention and promotion strategies in the maternal-infant health field	Fails to mention an at-risk group	Mentions at least one at-risk group to which HIV prevention and promotion and sexual health promotion efforts should be directed	Describes strategies related to the family and individual life cycles to reduce health care inequalities to prevent HIV and promote sexual health	Analyzes the effectiveness and efficiency of HIV prevention and promotion strategies
Main clinical strategies and tools for the control of HIV and their implementation at the local level	Fails to identify clinical strategies or tools	Describes general clinical strategies and tools	Describes general as well as local clinical strategies and tools	Describes clinical strategies and tools at the local level and explores obstacles and links between them
Intervention and improvement proposals in the above areas	No intervention or improvement proposals mentioned	Mentions one or more proposals	Describes the proposed improvement in terms of objectives, means and results	The proposal is described in terms of viable elements
Gender	Gender not mentioned as a social factor	Gender mentioned as a social factor	Describes local gender-related issues	Links gender-related issues to a proposal
Ethnicity	Ethnicity not mentioned as a social factor	Ethnicity mentioned as a social factor	Describes local ethnicity-related issues	Links ethnicity-related issues to a proposal
Discrimination and stigma	Discrimination and stigma not mentioned as a social factor	Discrimination and stigma mentioned	Describes local issues related to discrimination and stigma	Links issues related to discrimination and stigma to a proposal

According to table 44 the overall average score increased by nearly two points between the initial and final essays written by participants. With the exception of the Dominican Republic each individual country also

improved. This increase was greatest in Nicaragua (2.9 points) and Guatemala (2.7 points), and modest in Panama, whose average score increased by only 0.2 points (Figure 1).

Table 44. Overall initial and final essay score by country

	Guatemala		Nicaragua		Panama		Dominican Republic		**Total**	
	N	Median	N	Median	N	Median	N	Median	N	Median
Initial essay	45	7.4	46	8.8	44	7.2	45	6.4	180	**7.0**
Final essay	45	10.1	46	11.7	44	7.4	45	4.8	180	**8.9**

Figure 1. Overall initial and final essay score by country

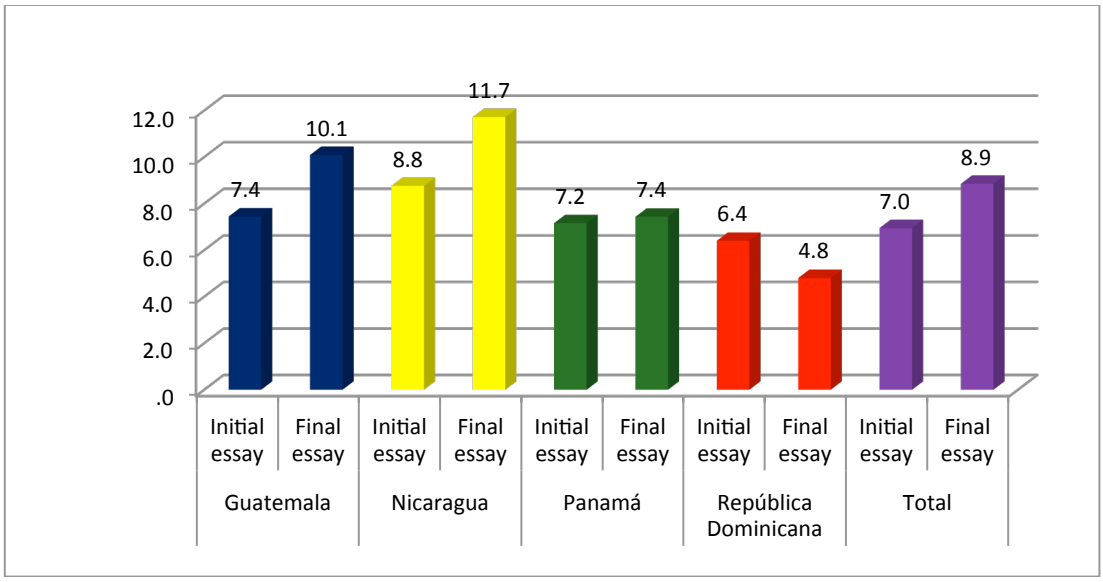


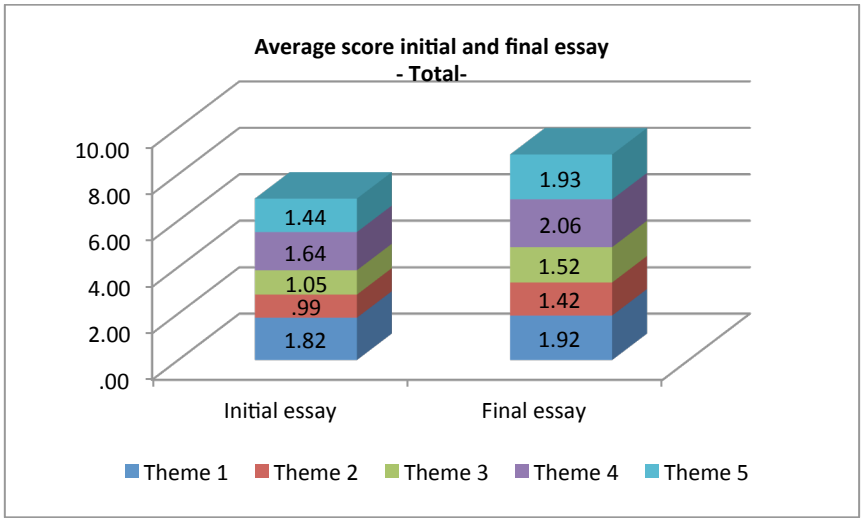
Table 45. Point categories (0-15) of initial and final essays

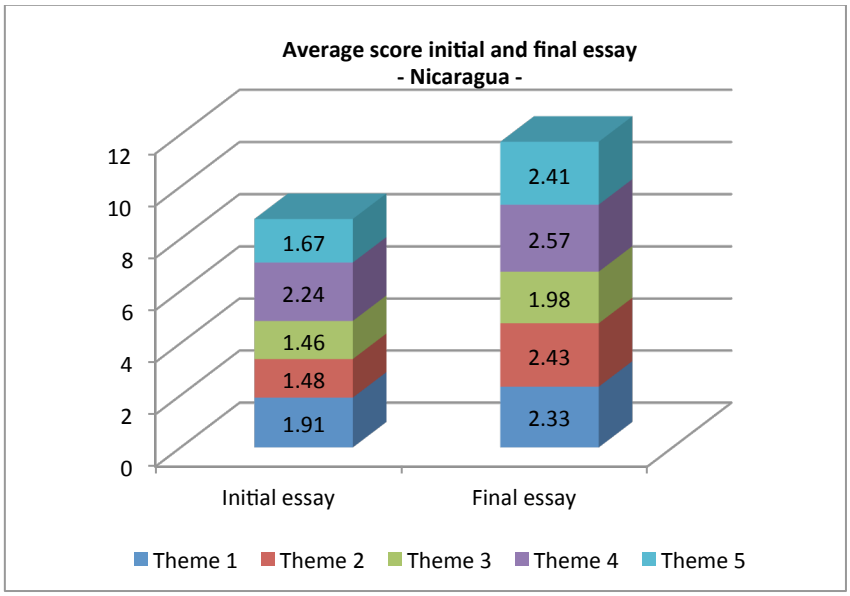
Points	Guatemala		Nicaragua		Panama		Dominican Republic		**Total**	
	Initial	**Final**	**Initial**	**Final**	**Initial**	**Final**	**Initial**	**Final**	**Initial**	**Final**
0	0	1			1	0	1	0	2	1
1	3	0					4	3	7	3
2			1	0	0	1	3	0	4	1
3	0	2	2	0	2	1	12	2	16	5
4	6	1	1	0	3	4	2	9	12	14
5	6	1	2	1	4	4	8	7	20	13
6	5	0	3	0	7	9	7	6	22	15
7	6	1	4	1	9	4	4	6	23	12
8	3	8	5	3	4	6	2	2	14	19
9	3	5	8	1	7	5	2	4	20	15
10	4	6	9	5	3	3	0	3	16	17
11	1	4	4	9	3	4	0	3	8	20
12	3	4	3	7	0	2	-	-	6	13
13	2	3	3	8	0	1	-	-	5	12
14	3	3	1	8	1	0	-	-	5	11
15	0	6	0	3	-	-	-	-	0	9
Total	45	45	46	46	44	44	45	45	180	180

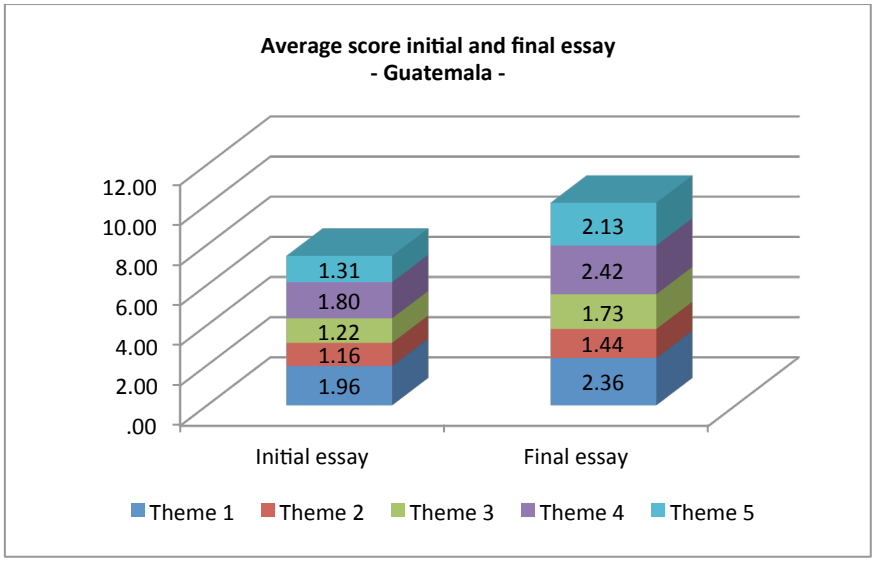
However, the level of analysis observed in the essays tended to be low, especially in the initial essays many of which did not progress past a descriptive level. As measured by the higher number of essays with higher scores and fewer essays with lower scores, Nicaraguan participants had the highest scores both before and after the course (Table 45).

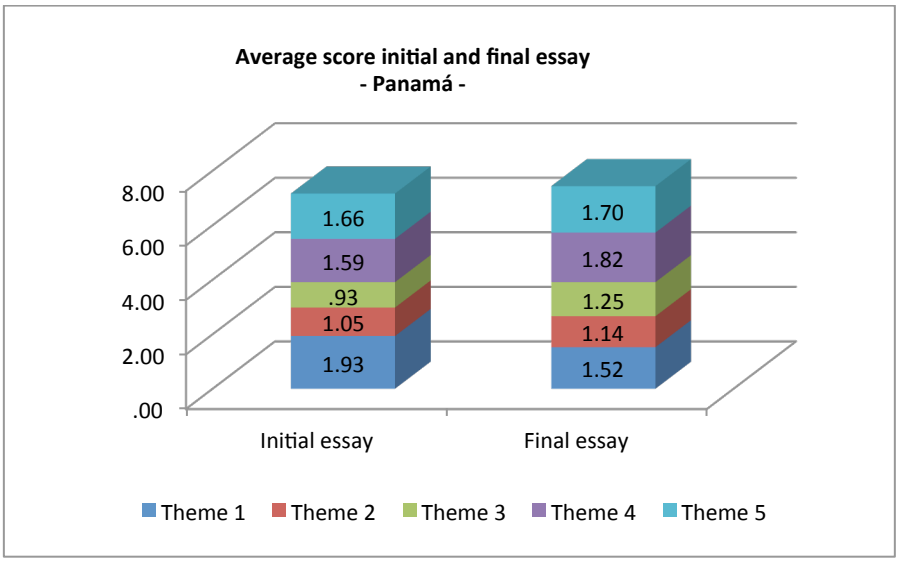
The average essay score also improved across all themes in Guatemala and Nicaragua, which was once again the country with the most dramatic increases (see Figures 2-6). Panamanian scores increased slightly for all themes except social determinants, and respondents from the Dominican Republic only increased their score for the fifth theme on intervention and improvement proposals.

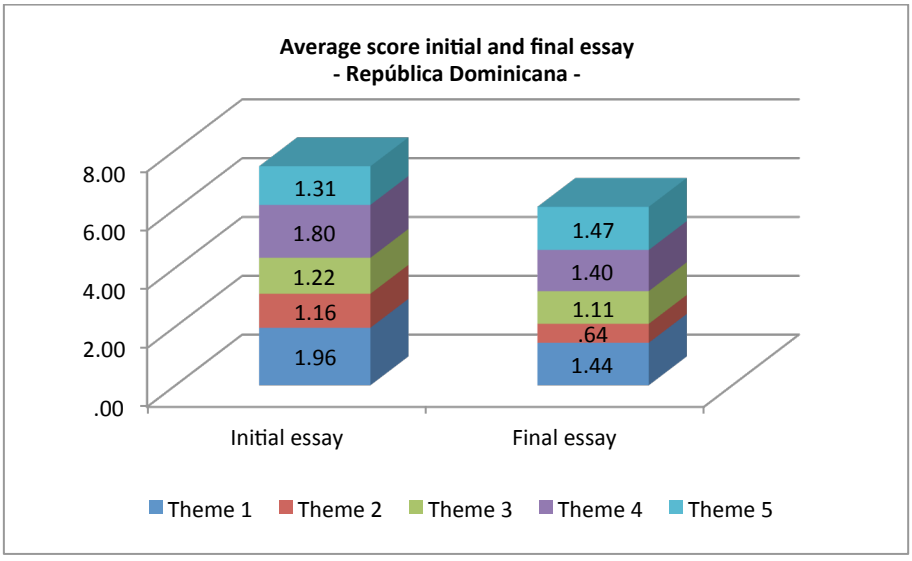
Figures 2-6. Average scores of initial and final essays by theme and country











Several factors could explain these differences by country, such as different experiences in implementing PHC models allowing certain participants a more complete understanding of the topics addressed by the course, or differences related to professional training and/or work experience. These variables were not

analyzed in this evaluation, however a factor that definitely affected essay scores of participants from Panama and the Dominican Republic was that only half the final essays responded to all of the questions. It is possible that incomplete tests respond to lack of experience in writing this type of essay, resulting in less substance when it came to answering the questions. Additional observations about the essay content, including differences by country, are discussed in Appendix 7.

7. Evaluation of JHU online course

A total of 235 students took the Johns Hopkins course on the clinical management of HIV and other prevalent infectious diseases at the primary care level. The four week-long topics were: initial management of HIV infected patients, HIV in pregnant women, opportunistic infections and chronic management of HIV and finally, other prevalent infections. The course's quantitative methodology permitted knowledge assessment via a written test prior to and at completion of each week's topic. Since the initial and final tests were identical this process assessed the level of knowledge gained and/or improved upon during the week.

Table 46 displays weekly test score results on a scale of 0 to 100 points and the median (with 95% CI) scores obtained at baseline and upon course completion. At completion of each week-long course, students from all countries had scores above 75 points. Furthermore, the increase observed in clinical knowledge between baseline and upon course completion as measured by weekly median scores is large and significant ($P < 0.05$) for every country.

Students increased their clinical knowledge by an average of 76.8 points each week, well above the 30% increase expected in JHU's original proposal. Worth nothing is that the low baseline averages for each of the participating countries may have been affected by several cases which had no initial value and thereby dragged down the overall average. Nonetheless, the consistent improvement achieved between the baseline and final scores achieved every week in all countries is striking.

Table 46. JHU course results by week and country and baseline and final results by country

Country (n)	Average final score by week and country				Baseline score Median (95% CI)	Score at course completion Median (95% CI)
	Final WEEK 1[1]	Final WEEK 2[2]	Final WEEK 3[3]	Final WEEK 4[4]		
GUA n=65	72.2	90.0	93.8	100	12.13 (11.06 – 13.19)	86.10 (83.88 – 88.32)
PAN N=50	88.8	95.0	93.8	100	14.35 (13.51 – 15.19)	91.45 (89.19 – 93.71)
NIC n=64	77.8	92.6	93.8	100	13.99 (13.02 – 14.95)	89.75 (87.83 – 91.67)
DR N=56	77.8	95.0	100	100	14.84 (14.06 – 15.63)	91.58 (89.53 – 100.0)
Total n=235	88.8	95.0	93.8	100	14.35 (13.97 – 14.72)[5]	91.18 (89.99 – 92.36)[5]

[1] Initial management of HIV infected patients
[2] HIV in pregnant women.
[3] Opportunistic infections and chronic management of HIV
[4] Other prevalent infections
[5] $P < 0.05$

8. Evaluation of GORGAS on-site course

All students completing the online courses were offered classroom-based training in Panama City. However, only 20 participants from Nicaragua attended, resulting in a total of 166 students. Specific competencies to be developed during the course were: reinforce the concepts learned during the online training; promote discussion and analysis of issues presented by speakers, mentors and participants during the online training; analyze the feasibility of implementing local project proposals; and work on the specifics of local projects as proposed by participants and their mentors via preliminary project presentations. The first two aspects are addressed in this section.

Students took a written test prior to course initiation that contained six multiple-choice questions related to counseling, diagnosis and treatment and 15 questions aimed at evaluating opinions on these topics (see Appendix 6). At the end of the week they repeated the same test in order to assess knowledge improvement on that week's topic. Below are the overall and country-specific results in knowledge improvement of the students who attended the on-site course. Although the median score is less than 50 points, knowledge rose significantly ($p < 0.05$) between baseline and final exams – 14.3 points on average.

Table 47. On-site course results by country and total [median (95% CI)]

Country (n)	On-site Initial Median (95% CI)	On-site final Median (95% CI)
GUA N=50	33.30 (28.08 – 37.52)	47.60 (42.32 – 52.88)
PAN N=47	38.10 (33.73 – 42.47)	52.40 (45.85 – 58.95)
NIC N=20	30.95 (27.61 – 34.29)	47.60 (40.93 – 54.27)
RD N=49	33.30 (27.96 – 38.64)	47.60 (41.19 – 54.01)
Total N=166	33.30 (28.66 – 37.94) [1]	47.60 (44.11 – 51.09) [1]

[1] $p < 0.05$

9. Transversal evaluation of online and on-site courses

The purpose of this analysis was to summarize and compare the information obtained from the different evaluation processes that took place during online and on-site training. The training and evaluation processes suggest the following time sequence:

Baseline --> PAHO Initial --> PAHO Final --> JHU Initial --> JHU Final --> On-site Initial --> On-site Final

Therefore the following hypotheses were tested:

1. H_o: PAHO Initial = Baseline (Expected to be the same)
2. H_o: PAHO Final = PAHO Initial (Expected to change)
3. H_o: JHU Initial = PAHO Final (Expected to be the same)
4. H_o: JHU Final = JHU Initial (Expected to change)
5. H_o: On-site Initial = JHU Final (Expected to be the same)
6. H_o: On-site Final = On-site Initial (Expected to change)

Figure 7 displays evaluation results at each stage. Importantly, only 34% of health providers from Guatemala, 26% from Nicaragua, 61% from Panama and 52% of providers from the Dominican Republic were from the selected communities and had therefore been interviewed at baseline. Furthermore, the baseline study questionnaire and course essays and exams did not ask the same questions. However, to quantitatively characterize and compare the knowledge demonstrated at each stage, the results of all processes have been standardized to the same scale (0 to 100 points). The data presented are mean scores with 95% confidence intervals.

The null hypothesis that PAHO Initial = Baseline is confirmed, as Baseline results are similar to those of PAHO Initial (50 versus 47), with no statistical difference between the medians ($P > 0.05$). This result was expected because no one had yet been trained at either point in time.

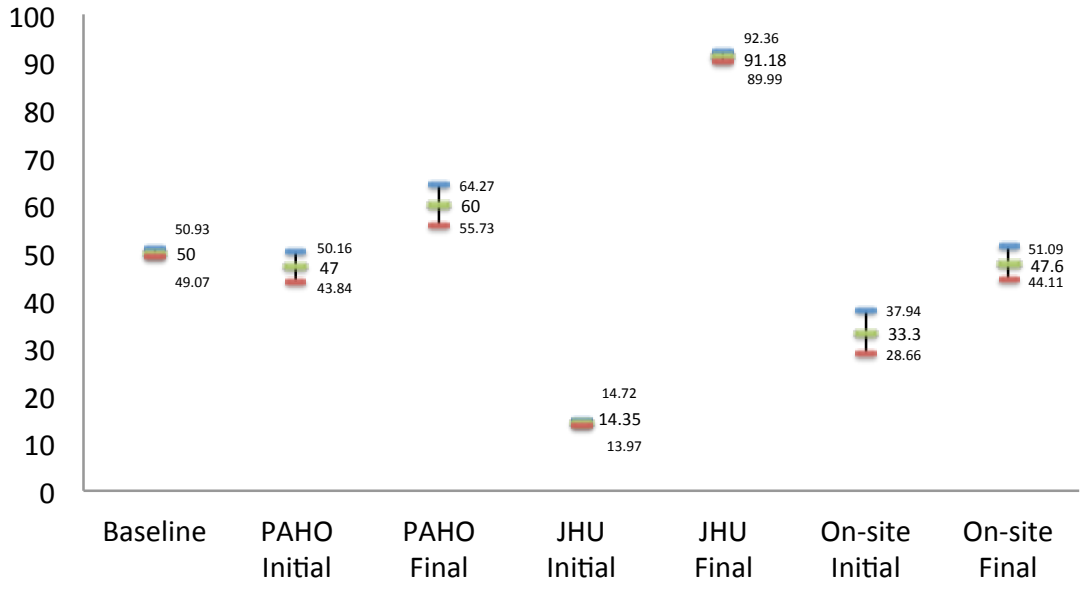
The null hypothesis that PAHO Final = PAHO Initial is rejected, as PAHO Final results are statistically superior to those obtained in the PAHO Initial measurement ($P < 0.05$). The average knowledge score rose by 13 points (from 47 to 60) across all participants ($n = 180$). This change is observed in all countries except for Panama, which shows no change.

The JHU Initial point range is significantly lower than the Baseline average ($P < 0.05$), which we attribute to the different areas of knowledge that were measured. Clearly participants lacked the type of clinical knowledge that JHU touched on in the course, compared to the type of knowledge measured at Baseline and compared to that measured for the PAHO course.

As for JHU Final = JHU Initial, the observed improvement in knowledge between the two time points is substantial and significant ($P < 0.05$), with students gaining 76.8 points on average across all countries. The low Initial JHU score must be taken into account in the analysis, as it could have been affected by several cases for which no initial value was observed and thereby have affected the overall initial average.

Finally, we can reject the null hypothesis that On-site Final = On-Site Initial. Although the final average score was less than 50 points, knowledge acquired from the training increased by an average of 14.3 points ($P < 0.05$).

Figure 7. Results of hypotheses tested for seven evaluation stages



10. Conclusions and recommendations for final evaluation

This report has described indicators used in the characterization of baseline knowledge, attitude and practices of health service providers, managers and users. This baseline characterization provides a theoretical framework that establishes the status of institutional strengthening capacity and needs of PHC services in Guatemala, Nicaragua, Panama and the Dominican Republic. It establishes a basis to evaluate increased organizational skills and PHC in the near future, in order to improve the comprehensive and integrated provision of services for HIV/AIDS and other prevalent diseases in these countries. There are a number of questions of interest that can be answered once final outcomes are measured:

- How effective was the strategy in increasing health system knowledge among personnel?
- How effective was the strategy in increasing provider skills in developing integrated strategies for prevention, diagnosis and treatment of HIV and related infectious diseases (RIDs)?
- Was the capacity building of health care workers achieved?
- Did the capacity building of the health care workers have an effect on achieving the integration of services?
- What effect may the integration be having?
- What challenges were encountered?
- How do capacity building and integration of services compare between countries?
- Is the provision of HIV and RIDs prevention, diagnosis and treatment being coordinated with primary care services?
- Is the quality of primary care services improving as a substantive outcome of integration?
- Is additional demand for health service being generated?
- If so, can health facilities meet this additional demand?

We hope that these baseline data will be useful in the final evaluation of program effectiveness.

10.1 Baseline evaluation.

As planned, the results obtained in this initial phase of the project reflect the baseline KAP of health service providers, managers and users at the primary care level regarding HIV and associated prevalent diseases.

In general, **basic knowledge of HIV was found to be deficient**, as measured by the macro-indicators composed of correct answers to selected questions. For example, the macro-indicator on health provider knowledge of transmission, prevention and treatment of HIV (Table 13) demonstrated that none of the respondents knew all of the answers. Each respondent should know all modes of HIV transmission, that the type of childbirth (vaginal vs. cesarean) matters for mother-to-child HIV transmission, that the VDRL test is part of routine prenatal care, that syphilis can be transmitted from mother to newborn, that HIV is a retrovirus, that Elisa and Western Blot are used to diagnose HIV, and how to evaluate HIV positive people (assess contacts, rule out opportunistic infections, assess immune status, decide if ART is necessary and if so which kind, and know about CD4 counts and teratogenicity of antiretroviral drugs). Even when correct answers were counted separately the weighted average was approximately 50%, reflecting an **intermediate level of knowledge among health care providers**. **In fact, most KAP indicators revealed an intermediate or deficient knowledge** as shown in Table 14.

The main objective of any training activity that takes place within the health system is that acquired knowledge is transferred to the community. Thus assessing population knowledge of HIV and RIDS is also of utmost importance. At minimum, people should know that HIV can be transmitted from mother to newborn, that mother-to-child transmission happens during labor, that HIV positive women should not breastfeed, that AIDS is incurable and they should know the basics about syphilis, genital herpes and HIV. As measured by the macro-indicator of HIV transmission knowledge, less than 10% of PHC users answered all of these questions correctly. However, the weighted sum varied between 60 and 70 points, indicating **a degree of**

knowledge of some variables among users interviewed in the participating countries. This is an important aspect which could be further analyzed in future evaluations.

Another major project objective was to assess the **current situation of the integration of HIV services**. Thus the macro-indicator on the integration of services included questions about *whether the facility offered the following services*: HIV testing and counseling, condom distribution and whether measures were in place to avoid vertical transmission. **None of the directors interviewed answered all of these questions affirmatively** (Table 17). Additionally, when we inquired about the integration of services — that the directors *affirm that those same services were integrated* in their respective facility — once again, none of the directors interviewed answered these questions affirmatively (Table 18). Only in Nicaragua did 100% of service directors state that they believed their health center was a comprehensive and integrated facility as defined by PAHO/WHO. Lower rates of agreement were observed for the remaining three countries. Since the courses emphasized this aspect it will be important to assess these responses in the final evaluation.

Another interesting finding that should be assessed in the final evaluation relates to **vertical transmission** prevention. The majority of health service providers and managers reported that HIV testing is offered during prenatal care, but **a low proportion of women who had been or were pregnant at the time of the interview said they had been tested or counseled or had been given the test results** (Tables 26-27).

Counseling has been and remains an importance aspect of health care in patients with HIV/AIDS and related diseases; for that reason both the online and on-site courses stress its necessity. When assessing knowledge of counseling, providers were asked if they knew that it should include **the importance of getting tested for HIV and VDRL during prenatal care**. Baseline data show that **less than half of providers across the four countries were knowledgeable about this concept** (Table 29). Moreover, when users were asked whether they had been counseled to be tested for HIV and/or VDRL and if so, whether they had been advised about key aspects of HIV and syphilis prevention, transmission and care, not one of the users interviewed responded affirmatively to all the options (Table 30). This indicator must be improved in the final evaluation.

Although **stigma towards HIV infected people was found to be higher among PHC service users, it was also observed in health care providers** (Tables 34 and 36). As mentioned in the qualitative study presented in this report, the issue of HIV-related stigma must continue to be strengthened in future courses.

To evaluate **quality of care improvement processes** it is necessary not only to evaluate the perception of service providers and users, but also other aspects such as supplies, medications, personal factors, etc. However, for the baseline evaluation service directors were only asked about referral systems, how to proceed with AFB positive patients and HIV testing during prenatal care. **Only respondents in Nicaragua said their facility met all of these criteria** (Table 38), so improvement in this indicator in countries is expected in the final evaluation.

10.2 PAHO course evaluation.

Although there was **evidence of overall improvement between the initial and final essays**, in some cases there was no change in the average score, and some actually declined. In these cases the lack of essay writing skill could likely be the cause, so the relevance of this technique should definitely be analyzed in the final course evaluation. However, it is clear that course participants improved their overall level of knowledge about HIV-related issues and a detailed review would measure this improvement at the individual level. The fact that some participants obtained lower scores on their final essays does not preclude the success of the course in this respect.

The results of this course could be considered a first approach at HIV awareness and knowledge acquisition. The next step is to translate this awareness into action, which requires that participants perform more

exercises involving linkage, analysis and interpretation which will help not only to visualize the problem but also to propose achievable solutions. Based on this discussion the following actions are recommended:

1. The online course consists of various expert lectures on different topics and situations; we suggest expanding the curriculum to include **teaching and learning activities to help relate the different concepts presented in the lectures**.

2. **Women, indigenous people and adolescents** represent at-risk groups who must be taken into greater consideration, not only to improve their sexual and reproductive health but also as a strategy to stop the spread of HIV/AIDS. The essays revealed a lack of attention paid to these populations, therefore, we suggest that the course **incorporate them as cross-cutting topics** such that all lecturers make reference to it and participants are made to carry out explicit activities related to women, indigenous people and adolescents.

3. Offering the same course to people with different levels of schooling and experience poses challenges for its evaluation. While the same educational platform and materials could be used, **activities should be commensurate with each type of participant's academic and work experience**, and a **tutoring process** to develop the full potential of each student should be put in place.

4. **The essay format should be re-considered as the most suitable type of learning assessment methodology** for this course, especially considering the participants' different educational levels. Composing an essay requires not only basic knowledge on the subject at hand but also writing skills such as argumentative resources and richness of vocabulary, as well as proper use of grammar and syntax. In fact, the initial essay should be an indicator of the ability of participants to perform this type of task. **The questions could also be re-worded to facilitate analytical work**. The fact that the questions were open ended without specific instructions about what was wanted from the discussion was a challenge for participants with lower educational levels. To avoid essays that simply list items and ensure that participants do not simply take their responses from the lectures or resolve them in groups, questions like "What are ...?" and "How do you ...?" should be replaced with questions that encourage analysis and reflection, for example: "Review statistics of HIV-positive patients treated in your health center -- do you think the service is adequate? What measures could be implemented to improve care for these patients?" Finally, regardless of the type of format used, the **tutors' instructions must be standardized** in order for students to be clear on what is expected of them, to have reliable and comparable results, to identify points that need to be reinforced or strengthened and in the end, achieve an optimal teaching and learning process.

10.3 Transversal course evaluation.

These baseline data provide important information for the participating countries that is complemented by the findings of the course evaluations. **All evaluations before and after training show improved results among participants in all countries**. **However**, **the strength of the observed trend** (60 points at completion of the PAHO course and 91 points at completion of the JHU course), **had diminished by completion of the on-site course**. As mentioned above, this course is evaluated on-site via a multiple-choice questionnaire related to counseling, diagnosis and treatment of HIV. The need for further analysis is reflected in the fact that baseline data and the results achieved do not reveal how the two methodologies (online vs. on-site) compare in terms of effectiveness and efficiency. These complementary methodologies need to be evaluated in greater detail.

11. Study limitations

The program had a clear commitment to providing training in the LAC region, particularly among health care professionals in underserved communities. Course coordinators had defined that 95% of the providers attending the courses should be from the main communities selected for the baseline. However, none of the participating countries met this requirement: only 34% of health providers from Guatemala, 26% from Nicaragua, 61% from Panama and 52% of providers from the Dominican Republic were from the selected communities and had therefore been interviewed during the study's baseline phase. It is therefore essential to define the methodology to be used in the final evaluation of the project according to the original design proposed for the evaluation.

Ideally the questions developed for the baseline questionnaires should have been prepared according to the specific contents of the online course components, but the questions used came from the general list of proposed contents. However, the macro-indicators and indicators created have assessed KAP regarding HIV and associated prevalent diseases, while also characterizing the current situation of the integration of HIV-related services.

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