

# Management of the HIV epidemic in Nicaragua: the need to improve information systems and access to affordable diagnostics

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## Introduction

Nicaragua, one of the poorest countries in Latin America, has one of the lowest HIV infection rates in the region. The estimated adult prevalence is 0.2%, with about 7700 people living with HIV in 2010.<sup>1</sup> Several factors limited HIV transmission during the 1980s, including a ten-year civil war accompanied by an economic blockade by the United States of America (USA), which isolated the country for several years; a relatively controlled commercial sex industry; low infection rates for injecting drug users; and a ban on the commercial sale of blood. In the late 1990s, however, the spread of HIV rapidly increased.<sup>2</sup> In 2009, the Nicaraguan Ministry of Health projected an 11.2% annual increase in cases by the end of 2010.<sup>3</sup> The prevalence of HIV–tuberculosis co-infection has also been rising.

Recent increases in HIV incidence may be related to low condom use. Gender norms and roles limit women's access to information and sexual and reproductive health services. Women accounted for 17% of new cases in 1996 and 29% in 2005.<sup>4</sup> Other vulnerable groups include prisoners, youth, indigenous and Afro-descendant populations and migrant groups. While condom use reported by women of reproductive age remains very low (between 4% and 12%),<sup>5</sup> it has increased among both men who have sex with men and sex workers (from 64% to 72% and from 70% to 94%, respectively).<sup>6</sup> Since the end of the civil war, many Nicaraguans spend part of the year working in neighbouring countries. There are some concerns that these seasonal migrants may be a source of new HIV cases, as they are neglected in terms of HIV prevention and treatment.<sup>7</sup> Access to health care and other services is difficult for illegal immigrants, who may also suffer from stigma and discrimination. Many migrants may

not seek HIV testing or treatment for sexually transmitted infections, and may engage in casual or commercial sex.

By the end of 2008, a total of 1069 people were receiving antiretroviral therapy (ART) in Nicaragua,<sup>6</sup> although around 2600 people should have been receiving such treatment according to World Health Organization guidelines.<sup>1</sup> The supply of ART and drugs to treat opportunistic infections relies on financial support, mainly from the Global Fund to Fight AIDS, Tuberculosis and Malaria. Increased use of ART has dramatically reduced AIDS mortality from 36% in 1997 to 7% in 2007.<sup>4,6</sup>

## Challenges ahead

As in many lower middle-income countries, Nicaragua faces a variety of challenges in controlling the spread of HIV. Gender norms tolerate male sexual irresponsibility and inhibit women from actively speaking to their male partners about safe sex, while there is also continuing stigma and discrimination against homosexuals, sex workers and people living with HIV. Behaviours and attitudes must be addressed to promote consistent condom use among young people. Improvements are needed in the health system to increase the capacity for case detection and confirmation, disease surveillance, and therapy-related monitoring, including testing for resistance to antiretroviral drugs.

## Case detection

Aiming to improve diagnostic capacity, the Ministry of Health decentralized the use of HIV rapid tests, which has led to a sixfold increase in nationwide use (from 18 000 patients in 2006 to 106 726 in 2008), primarily among pregnant women.<sup>6</sup> HIV testing is available in all 153 municipal-level health centres. Patients can only be tested if they give consent. If the first HIV rapid test is positive, a second test is done.

If both rapid tests are positive, the sample is sent to a regional facility for confirmation using enzyme-linked immunosorbent assay (ELISA). All positive and 10% of negative samples are sent to the National Diagnostic and Reference Centre in Managua for quality-control. Any discordant results are sent for a Western blot test at the Centre's reference laboratory.

Confirmatory ELISA testing can take two to six weeks, while the processing time for the Western blot test averages two to three months. Delayed confirmation of HIV status contributes to patient dissatisfaction and delays counselling to prevent transmission and initiation of ART.

## HIV surveillance

Case surveillance is done under the Epidemiological Surveillance System, a mostly paper-based system involving the transfer of data by radio or telephone.<sup>4</sup> Each week, peripheral health facilities send their data to municipal health centres, who then send it to one of 17 of the country's health departments and finally it goes to the Ministry of Health. In the case of HIV/AIDS, the Epidemiological Surveillance System receives daily and weekly reports from Ministry of Health units, laboratories, blood banks, non-governmental organizations and private clinics. By the end of 2008 connectivity to the internet was restricted to a few hospitals, most of them in Managua, and even less to municipal health centres. None of the 1000 health posts had connectivity.

## Antiretroviral therapy monitoring

The rising number of HIV/AIDS cases in Nicaragua has increased demand for ART, which has in turn placed a greater demand on laboratories to support patient follow-up. The national HIV control programme, the National Di-

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agnostic and Reference Centre, health facilities and civil society groups have called for higher priority to be given to improving ART monitoring, through decentralization of CD4 and viral load testing, as well as testing for tuberculosis co-infection. Currently all viral load testing is done at the National Diagnostic and Reference Centre at an average total cost of 100 United States dollars (2008/2009 prices).<sup>8</sup>

Despite this high cost, there is often a delay in delivery of results to the patient's health-care provider, which limits the test's value for ART management. The information flow for quality control tests and the return of ART follow-up results is extremely slow. The time taken from the collection of the sample to delivery of the results generally ranges from 20 to 40 days, and can be even longer. This depends on factors such as the availability of reagents, the speed with which the sample and the results are transported (often waiting to use a vehicle programmed for another activity), and the multidisciplinary team being informed of a positive confirmation. This delayed turnaround means that the result is often not used to inform a treatment decision. Patient costs also present a significant challenge to testing.

"MINSa [Ministry of Health] has started to decentralize treatment with antiretrovirals but decentralization of CD4 and viral load testing is needed, too. One of the problems is ensuring people go to the laboratory for testing. This is because many people with AIDS are very poor (95%, I believe), so much so that they don't always have the money to pay for transport to Managua." (Representative from ASONVIHSIDA [Nicaraguan Association of Persons Living with HIV/AIDS], Managua).

## Discussion

Efforts to contain the HIV/AIDS epidemic in Nicaragua have already led to some important progress. New policies to extend HIV screening, surveillance and treatment have improved case detection, increased use of rapid tests and decentralized management of ART patients. Increased access to HIV screening has been achieved through the decentralization of rapid tests and continued promotion of the importance of knowing one's HIV status. Preventive behaviour has improved among high-risk populations, such as sex workers, but not among young people, who are becoming increasingly affected. Improved ART availability has increased the survival rate of people living with HIV/AIDS. These achievements required significant international aid, mainly from the Global Fund to Fight AIDS, Tuberculosis and Malaria.

Sustainability of these activities will depend in part on resolving inefficiencies, one source of which is the information management system, which has particularly high costs in HIV case detection, surveillance and monitoring. Epidemiological surveillance is fragmented and mainly manually-operated. Information is not systematically shared and analysed by the national programmes, let alone by primary health-care providers. Yet this system is critical for timely decision-making, particularly in implementing immediate actions to control sources of infectious diseases and guarantee health and laboratory supplies.

Other challenges include the delayed reporting of test results, particularly confirmatory tests, and the high costs for patients to travel to health facilities.<sup>8</sup> An improved, automated system would facilitate fast return of laboratory results, statistical updates and reports. However,

in Nicaragua, internet penetration is only 10%, which is far less than in neighbouring countries (Costa Rica: 45%; Mexico: 30%; USA: 77%).<sup>9</sup> In this context, mobile phone text messaging could provide an option for collecting and sending epidemiological information,<sup>10</sup> although its applicability needs to be carefully assessed.

## Conclusion

Nicaragua received a second grant from the Global Fund to Fight AIDS, Tuberculosis and Malaria of more than US\$ 60 million to finance a five-year national HIV project, beginning in 2010. Strengthening the provision of health services – including increasing access to HIV testing and monitoring – is an essential part of this project. In this respect, funds could be used constructively to improve the national health information system by investing in basic information technology infrastructure. Such investments would have a positive impact on the control and management of HIV as well as other high-burden diseases that may receive less funding. The issue of sustainability, however, will not be easily resolved. Developing affordable, effective tools and systems for diagnosis, surveillance and patient monitoring will remain a key concern for Nicaragua and other lower middle-income countries in the years ahead. ■

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