

# Prices of Reproductive Health Medicines in Nicaragua

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1455 NW Leary Way  
Seattle, WA 98107-5136 USA  
Tel: 206.285.3500 Fax: 206.285.6619  
[www.path.org](http://www.path.org)

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## **Authors**

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- Lic. Socorro Treminio, Faculty of Medicine, León.
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## Introduction

Poor reproductive health constitutes a significant portion of the disease burden in developing countries, yet essential reproductive health medicines often are not available to the majority of the population in these countries. This leaves millions of women and men vulnerable to unwanted pregnancy, sexually transmitted infections (STIs), including HIV/AIDS, and unsafe childbirth. For example, it is estimated that approximately 201 million couples who are at risk of unintended pregnancy, and who would like to space or limit their births, are not using modern contraception to do so.<sup>1</sup>

Access to contraceptives, obstetrical and antenatal medicines and technologies, and STI and HIV/AIDS drugs is a fundamental requirement for maintaining good sexual and reproductive health services. Increased demand, inefficient resource use, lack of government commitment and/or resources, and donor support that has not kept pace with demand, have all contributed to this lack of access to reproductive health commodities. Ensuring the availability of and access to essential reproductive health medicines—contraceptives, medicines for prevention and treatment of STIs and HIV/AIDS, and medicines that enable healthy pregnancy and delivery—requires strong government commitment and a range of activities to guarantee financing, procurement logistics management, and effective service delivery.

Product price may be one barrier to access, putting medicines out of the reach of large population segments. Rigorous, or even cursory, price data for reproductive health medicines and commodities within and across countries are generally unavailable, and what data are known from individual countries are not widely disseminated. The World Health Organization (WHO) and Health Action International (HAI) developed a methodology to obtain price information for essential medicines through a systematic approach that involves onsite collection of retail prices of common medicines from a sample of public, private, or other sector dispensaries in a country. The methodology, which is described in the workbook, *Medicine Prices: A New Approach to Measurement*, was designed to be a low-cost, reliable way to help meet the need for greater transparency on prices in the international medicines marketplace.<sup>2</sup>

In 2005, PATH and John Snow International (JSI)/DELIVER collaborated to conduct pilot reproductive health commodity price measurement studies in two developing countries using this methodology. PATH and JSI/DELIVER felt that the WHO/HAI approach would be valuable in providing a pricing context for reproductive health medicines and worked on developing a list of essential reproductive health medicines that could serve as indicators for pricing and accessibility.

PATH conducted a study of reproductive health commodity prices in Nicaragua while JSI/DELIVER conducted a similar survey in Nepal. These studies aimed to gain an understanding of how prices and price components of reproductive health commodities affect the end user's ability to access these reproductive health medicines and how this affects *access*, *affordability*, and *equity* for all population segments. If essential reproductive health medicines are available, affordable, of good quality, and properly used, they can significantly improve reproductive health.

## **Background**

In April 2005, PATH implemented a field study to measure the prices of reproductive health medicines in Nicaragua using the WHO/HAI standardized methodology. The research documented and compared the prices of medicines in different health sectors in different regions. Data on prices for 28 reproductive health medicines were collected in the public, private, and nongovernmental organization (NGO) sectors in the capital city of Managua and in the cities of León and Matagalpa. The availability and affordability of the medicines was also measured.

The overall goal of this study was to collect data on price and access and to make these data available for policy formulations. Additionally, in carrying out the study, we hoped to assess the effectiveness of the methodology to examine reproductive health medicine prices specifically, suggest future directions of pricing research for reproductive health supplies, and identify how such information can be used in shaping reproductive health policy.

The specific objectives of this study were to answer the following questions:

- How do reproductive health medicine prices vary across sectors in Nicaragua?
- What is the difference in price between high-priced generic or innovator brand products and lower-priced generic equivalents?
- How affordable are reproductive health medicines in Nicaragua?

## ***Country context***

Nicaragua is the third most populous country in Central America, and although fertility and mortality rates have improved over the last decade, nearly half of all Nicaraguans still live in poverty. With a population of five and a half million people,<sup>\*</sup> approximately 48 percent of Nicaraguans live below the poverty line.<sup>3</sup> The gross national product per capita is 703 US dollars.<sup>4</sup>

As the second poorest country in the Western Hemisphere, Nicaragua ranked 121 on the Human Development Index in 2003, and public health challenges persist despite advances in health and education over the last decade.<sup>†,5</sup> Despite the overall decrease in the fertility rate in recent years, the population of young Nicaraguans will continue to grow. Nicaragua currently has one of the highest rates of adolescent fertility in Latin America (138/1,000 births are to young women between the ages of 15 and 20), and 49 percent of girls have been pregnant at least once by the time they reach the age of 19.<sup>‡,6,7,8</sup>

Contraceptive prevalence in Nicaragua is relatively high, but access to contraceptive methods correlates to poverty; unmet contraceptive need among the poorest women is more than double that among the wealthiest.<sup>9</sup> Although highly restricted, abortion is prevalent in Nicaragua, with between 16 and 21 percent of all pregnancies ending in abortion.<sup>8</sup> Maternal mortality rates are high; the 2000

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<sup>\*</sup> The government of Nicaragua's estimate of 5.5 million people in 2003 is used in this report.

<sup>†</sup> The average Nicaraguan has less than five years of schooling, and nearly half a million children aged 3 to 12 remain outside the formal education system; population growth is estimated at 2.6 percent, one of the highest in the region, undercutting economic gains; and there are serious inequities in health care access for the poorest 40 percent of the population.

<sup>‡</sup> While the median age of sexual debut for girls in Nicaragua is 17.8 years, early adolescent sexual activity is not uncommon, and nearly 11 percent of girls have sex before they are 15 years old.

adjusted maternal mortality rate reported by the United Nations Children's Fund was 230 per 100,000 live births.<sup>4</sup> These deaths occur at a disproportionate rate among poor, uneducated women—the result of extremely limited access to health care in rural and poor urban areas.<sup>8</sup>

For administrative purposes, Nicaragua is divided into 15 departments and two autonomous regions. Within the country there are three distinct geographical regions—the Pacific Lowlands, North-Central Mountains, and Atlantic Coast. The Ministry of Health (MOH) is the primary provider of health services. There are 17 district health offices (SILAIS), which are responsible for the public health outlets in those districts. These include the district hospitals, primary health care centers (PHC), and health posts. Between 1997 and 2000, about 60 percent of primary health care provided was supported by the MOH, 10 percent by the Nicaraguan Social Security Institute (INSS),<sup>§,10</sup> 20 percent by private programs, and 10 percent by others.<sup>9</sup>

## **Methodology**

The fieldwork carried out was based primarily on the WHO/HAI methodology using a short list of medicines to gather price comparisons across health sectors. The methodology provides a planning outline for site and sector selection as well as a sampling framework. It also offers suggestions for identifying data collectors, coordinating study activities, and selecting thematic areas for analysis.

A priority first step for the survey team was the establishment of a Technical Advisory Group (TAG) consisting of representatives from the MOH, the pharmacy association, the school of pharmacy, local NGOs, and a social marketing group. In addition to providing technical advice and guidance, this group provided critical perspectives on how to best tailor the research to the prevailing issues of the country.<sup>\*\*</sup>

In preparation for this research, PATH and JSI prepared a model reproductive health medicines list made up of a cross-section of essential and commonly used products. The list, which is a condensed version of the recently published interagency nonproprietary list of essential reproductive health medicines,<sup>11</sup> is divided into major reproductive health treatment areas: family planning (contraceptives), STI/HIV/AIDS, antenatal and obstetrics, and neonatal care.

The team shared this list with TAG members prior to starting the data collection. The list was subsequently modified to include only commodities available in Nicaragua (e.g., subdermal implants were not included). However, the female condom, though unavailable in Nicaragua, was

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<sup>§</sup> Since 1992, health insurance plans funded by workers, employers, and the state have purchased health services for the insured and their dependents from organized service providers. This model has permitted greater participation by the private sector in the health services market. During the 1980s, the infrastructure of the Nicaraguan Social Security Institute (INSS) and its health resources were transferred to the state and came under the control and administration of the Ministry of Health. The INSS continues to play its traditional role as collector of insurance fees, but it has transferred responsibility for health care activities to the 32 health insurance companies. The INSS serves as facilitator and supervisor of health activities in order to assure adherence to minimum quality standards in the delivery of services.

<sup>\*\*</sup> For the past five years, PATH has been implementing a pharmacy capacity-building project in Nicaragua and as a result has developed good collaborative relationships with these partners, thereby facilitating the execution of this research study.

kept on the list.<sup>††</sup> TAG members also identified supplemental products they felt were important to include. As a result, two additional products that are commonly used to treat STIs were added: ciprofloxacin (500mg) and amoxicillin (500mg).

A total of 28 medicines were included in the survey. Of these 28 medicines, 13 are included on the national Essential Medicines List of Nicaragua. Appendix 1 lists the surveyed medicines and their dosages. Table 1 presents the medicines by treatment category.

**Table 1. Reproductive health medicines by treatment category**

Contraceptive methods	STI/HIV/AIDS treatment	Antenatal care	Obstetrical/ neonatal care
Male condom	Amoxicillin tablet	Tetanus toxoid vaccine injection	Ergometrine (two presentations)
Female condom	Benzathine benzylpenicillin	Iron tablet	Misoprostol <sup>‡‡</sup>
Injectable, medroxyprogesterone acetate	Ciprofloxacin tablet	Folic acid tablet	Magnesium sulfate
Combined oral pill, monophasic (ethinylestradiol + norgestrel)	Co-trimoxazole (two presentations)	Sulfadoxine + pyrimethamine	Oxytocin
Combined oral pill (ethinylestradiol + levonorgestrel)	Doxycycline tablet		
Oral pill, progestogen (levonorgestrel)	Metronidazole (two presentations)		
Oral pill, progestogen-only (norgestrel)	Nevirapine (two presentations)		
Emergency contraceptive pill			
Copper intrauterine device (IUD)			

PATH examined the prices of these reproductive health commodities in the public sector, private-sector pharmacies, and NGOs that specialize in reproductive health. The WHO/HAI methodology suggests collecting price information for both the innovator brand product and the lowest-priced generic product. However, the majority of the products on the reproductive health medicines list, particularly the contraceptive methods used in the survey, have been available off-patent for some time and innovator brands may be scarce. As a result, data were collected for two products under each international nonproprietary name: (1) the highest-priced generic or innovator brand product

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<sup>††</sup> The study team considered the female condom a contraceptive method with a potential market in Nicaragua. Therefore it was kept on the list even though it was not available in the country because concrete evidence of reproductive health products not found could have policy-related implications.

<sup>‡‡</sup> Misoprostol is used off-label for obstetrical and gynecological indications such as treatment of postpartum hemorrhage, cervical ripening, and labor induction.

and (2) the lowest-priced generic brand product.<sup>§§</sup> The highest-priced generic or innovator brand product was identified prior to data collection by the TAG members, in consultation with the MOH. In all sectors, the survey team also measured the availability of the medicines at the time of data collection. All prices were converted to US dollars using the exchange rate (buying rate) on March 31, 2005.

### ***Sampling: Site selection and facility type***

The WHO/HAI methodology delineates four specific price categories from which to gather data. These categories, which were included in the Nicaragua study, are:

- *Medicine procurement prices*: Prices from government, private importers, and NGO procurers.
- *Public-sector patient prices*: Prices paid by patients at government, municipality, or other local authority health facilities, including clinics and hospitals, health centers, pharmacies, and central or regional medical stores.
- *Private-sector patient prices*: Prices paid by clients at retail pharmacies and pharmacies in private clinics and hospitals.
- “*Other*” sector patient prices: Prices paid by patients at NGO clinics (or other health facilities depending on the country context).

The WHO/HAI methodology specifies that medicine facilities (or medicine “outlets”) be purposively sampled from at least four geographic areas based on their proximity to urban centers and to one another. Adapting to resource constraints, PATH included three geographic areas in the Nicaragua study: Pacific, Western, and Central.<sup>\*\*\*</sup> The cities or districts represented were Managua (Pacific), León (Western), and Matagalpa (Central).

The public health facilities were used to anchor the sample. Within each of the three administrative areas, the selection of facilities was based on their proximity to the main public-sector hospital. The number and range of facilities recommended by WHO/HAI consist of:

- Public sector: main hospital; four other public health facilities per region.
- Private sector: at least four pharmacies per region.
- Other sector: four NGOs or “other” outlets.

If the number of any particular type of facility is less than the recommended four—as was the case in Nicaragua—the methodology recommends increasing the number selected from the other lists. For instance, in the Central region, there are only two public health clinics and three NGO clinics. A total of 39 public and private-sector health facilities and NGO sector clinics were included in the study. Medicine procurement prices were also collected from one government and two private importers in the capital city. Table 2 illustrates the number and type of facilities sampled.

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<sup>§§</sup> In some cases, the highest-priced generic brand may have been the innovator brand, such as with Ciprofloxacin, Nevirapin, Medroxyprogesterone Acetate, Sulfadoxine + Pyrimethamine, and Misoprostol. However, no consistent difference was observed between the price ratios of these medicines, when available, and the other high priced generic products.

<sup>\*\*\*</sup> Inclusion of the Atlantic Coast region would have strengthened the results of this study; however it is logistically very difficult and expensive to reach.

In Nicaragua, the INSS contracts with private medical providers (EMPs) to provide medical care to its beneficiaries and dependents. EMPs function as private businesses, but they are located in both private and public health establishments and have altered pricing structures. These medicine outlets serve two functions. The first is to provide medicine for individuals who are insured through the INSS. A basic list of medicines is provided to INSS-insured individuals. Second, for medicines not on the INSS list, the EMP sells the medication directly to the individual, sometimes at a discounted price. For non INSS-insured individuals, the EMP acts as a private pharmacy. For the purposes of this study, EMP facilities are analyzed in the “private” sector analyses.

**Table 2. Facility sample distribution**

<b>Region</b>	<b>City</b>	<b>Hospital</b>	<b>Pharmacy</b>	<b>EMP</b>	<b>Public health clinic</b>	<b>Nongovernmental organization clinic</b>	<b>Total</b>
Western	León	1	4	2	3	1	11
Pacific	Managua	2	5	3	4	3	17
Central	Matagalpa	1	4	1	2	3	11
<b>TOTALS</b>		<b>4</b>	<b>13</b>	<b>6</b>	<b>9</b>	<b>7</b>	<b>39</b>

### **Data collection**

A standard medicine price data collection form was used to record the information for procurement and medicine outlets (Appendix 2). The WHO/HAI format allowed the team to record facility information (e.g., name and location) and develop a unique facility identification number for data. Procurement price information was collected for the most recent procurements, not averaged for multiple procurements over time.

The survey team consisted of pharmacy students from the National Autonomous University of Nicaragua in León. These students were identified by TAG members as possessing the pharmacological and country knowledge and skills necessary for effective data collection. Survey team members were trained in a two-day workshop that included pre-testing the tool at pharmacies in León to ensure the reliability and reproducibility of the survey. The survey team was in the field for a five-day period in April 2005 visiting public and NGO facilities and private pharmacies to investigate medicine availability and pricing.

The survey team collected reproductive health commodity pricing data from 39 medicine facilities in the three cities/districts in three regions in Nicaragua. The next section provides survey results. It includes data on procurement efficiency, defined as having a median procurement price ratio of close to 1 (or equal to the international median reference price) and brand premium, or difference between the highest-priced generic or innovator brand product and lowest-priced generic product. The report also presents patient prices, product availability, and product affordability by examining the costs of some common reproductive health treatments and comparing them with the daily wage of the lowest paid government worker.

## Results

The findings of this study are based on the analysis of data collection from the 39 public, private, and NGO health outlets in Nicaragua. In addition, the survey teams collected data from three procurement agencies.<sup>†††</sup> The following research findings will be discussed:

- Procurement efficiency.
- Median medicine price ratios for the highest-priced generic and the lowest-priced generic reproductive health medicines across sectors and regions.
- Reproductive health medicine availability on the day of data collection.
- Reproductive health medicine affordability.

The section on procurement examines brand premiums as well as procurement efficiency. Brand premium in this context refers to the difference in price between the highest- and lowest-priced products. The difference is expressed in this report as a ratio. Procurement efficiency examines whether procurement prices are comparable with median international prices. The analysis of the medicine outlets also looks at brand premiums, as well as price variations between the private, public, and NGO sectors. The sections on product availability and affordability look at the percentage availability in medicine facilities of the reproductive health medicines and the affordability of those medicines for specific uses.

Most of the results will be presented in comparison with international reference prices (IRP). The IRP source used in this study is the Management Sciences for Health (MSH) *International Drug Price Indicator Guide*, 2004 edition.<sup>12</sup> This annually published guide details maximum, minimum, and median international procurement prices for more than 900 drugs and non-drug consumables. The guide lists prices for nonproprietary products supplied by, for example, the International Dispensary Association, UNFPA, and procurement agents. The IRP used in this study is based on the median price for nonproprietary medicines quoted in the MSH price guide. This means, for example, a comparison of high-priced generic products with the median IRP would likely result in sizeable variation. One would not expect consumer prices in any sector to be equivalent to IRP prices which benefit from volume discounts. However, the IRP does serve as a baseline against which to evaluate pricing increases borne by consumers. A list of IRPs for the medicines studied is included as Appendix 3.

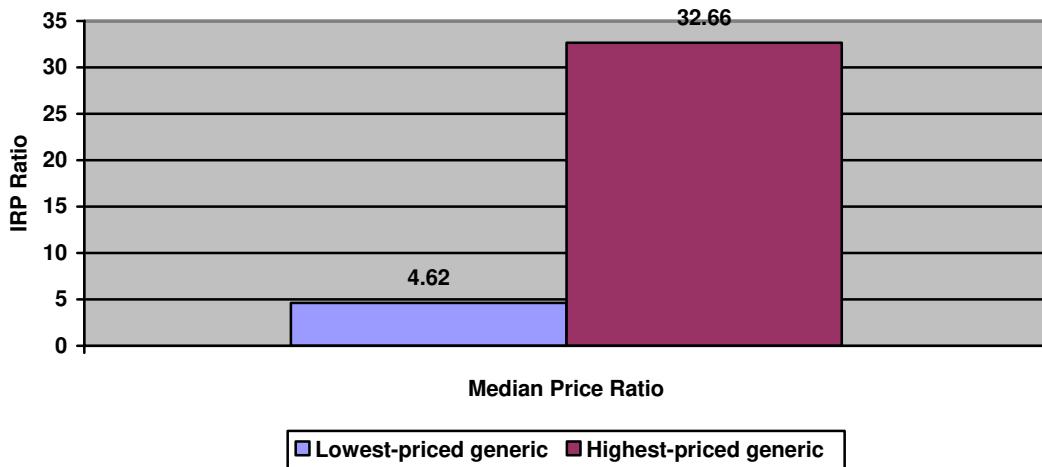
### **Procurement efficiency**

The team collected data from three procurement agencies—one public and two private. The survey showed a cross-sectoral (private/public) median procurement price ratio of lowest-priced generic products at 4.62, indicating that procurement of the lowest-priced reproductive health products was almost five times the IRP (see Figure 1).

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<sup>†††</sup> Two private importers and a public sector procurement agency were surveyed in Managua to obtain procurement price data.

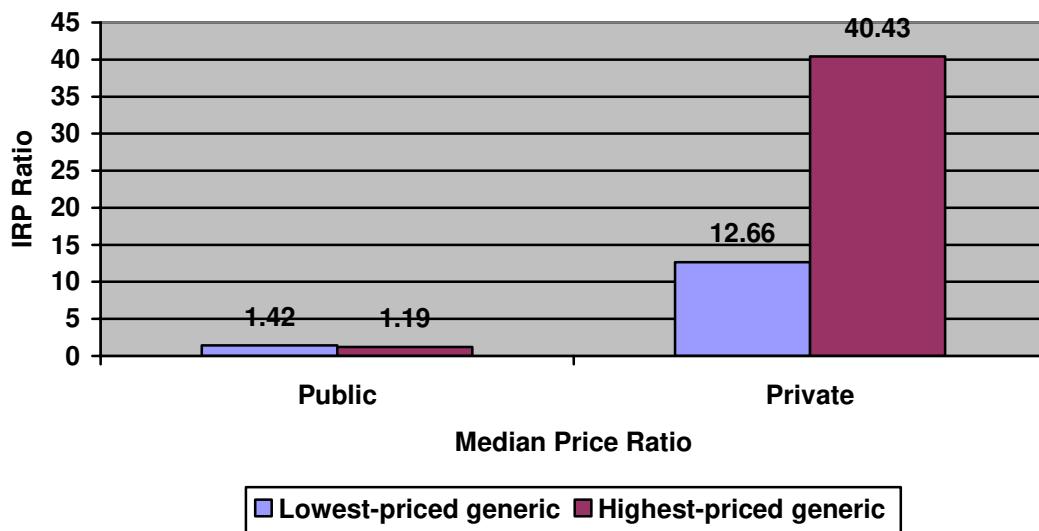
**Figure 1. Cross-sector procurement efficiency for lowest- and highest-priced generic products**



It is important to note that because of the small sample size (three procurement agencies), a medicine price was included in the ratio if it was found in at least one of the procurement agencies. Since there were more medicines found in the private-sector agencies, these ratios are skewed in favor of the private-sector procurers. However, when the public sector is examined separately, the median lowest-priced generic product price ratio is considerably less at 1.42. With efficient public procurement, public net price ratios (no patient charge added) should be approximately 1, which is close to the IRP. In the public sector, 50 percent of lowest-priced generic medicines surveyed were found in the range of about 1 to 6 times the IRP. The maximum lowest-priced generic price ratio was 71.19 for co-trimoxazole. Surprisingly, the median price ratio for highest-priced medicines in the public-sector procurement agency was *less* than that of the lowest-priced at 1.19. However, due to the fact that there were fewer highest-priced generic products procured by the public-sector procurement agency, this discrepancy may be due to a small sample size rather than more efficient procurement of highest-priced generic medicines.

In the private-sector procurement sites, the distributor's median price ratio was 12.66 for lowest-priced generic products and 40.43 for highest-priced generic products. This represents a 319 percent brand premium (the difference in price between the highest-priced and the lowest-priced of the same generic product). Figure 2 illustrates the median price ratio differences between public and private procurement agencies. Only one public-sector procurement agency was sampled, so these results do not reflect a comparison of multiple public procurement agencies.

**Figure 2. Sector comparison of procurement efficiency**



This research did not identify detailed information about price components or cumulative mark-ups. However, Law Number 182 (Law in Defense of Consumers), Article 43 dictates the maximum allowable mark-up amounts in Nicaragua. The Ministry of Promotion, Industry and Commerce has primary responsibility for enforcing pricing policies and regulations for foreign importers and laboratory distributors. The final retail price is based, in part, on the maximum price margin allowance for each entity in the distribution chain.

An import duty is levied on all medicines coming from abroad and about 80 to 90 percent (by value) of medicines are imported into Nicaragua. Distributors and importers are permitted to add a distribution and profit margin of between 30 (for brand products) and 35 (for generic products) percent in sales transactions with retail pharmacies. The maximum allowable retail mark-up permitted by the retail pharmacy is another 30 (brand) to 35 (generic) percent. One of the distributors we collected data from said that only about 20 percent of the medicines it imported were generic. According to another agency interviewed, this amount was 40 percent. There is no law that mandates prescribing generic products in the private sector. However, prescribing generic products is required in MOH facilities.

### **Patient prices**

The patient price component analyzes the “typical” prices paid for an entire set of reproductive health medicines, both within and across the public, private, and NGO sectors. This section summarizes the median (mid-point) price ratios of all medicines monitored and the size of the price variation between types of facilities.

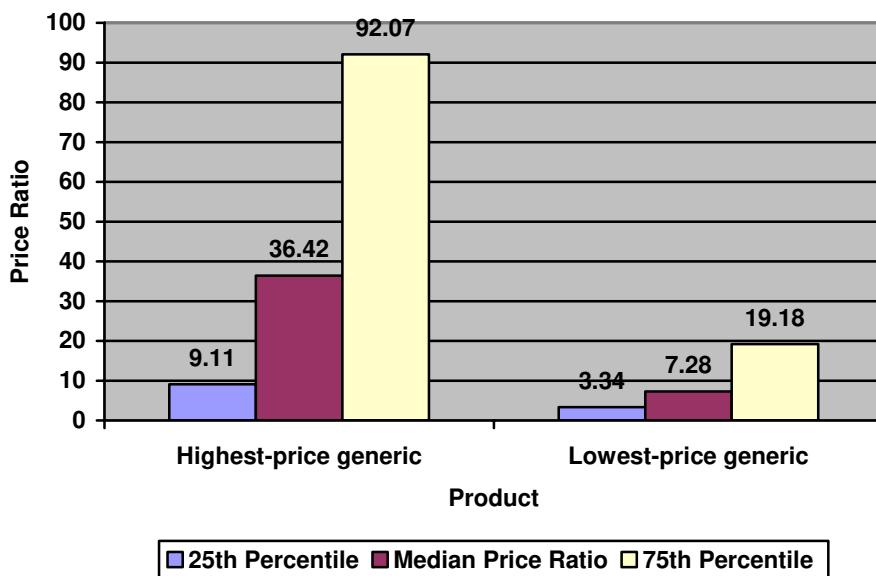
#### *Patient prices in the private sector*

In general, and not surprisingly, medicines were most expensive in the private sector. Overall, the highest-priced product in the private sector was at least 2 times the cost of the lowest-priced generic equivalent, and in the case of the combined oral pill (ethinylestradiol + norgestrel), the highest-

priced generic product was 11.5 times the cost of the lowest-priced generic equivalent. The largest price ratio identified in the private-sector pharmacies was metronidazole injection, which was 694 times the IRP. No lowest-priced generic equivalent of this product was found in any of the private-sector outlets. The lowest price ratio found was for the lowest-priced generic intrauterine device (IUD), which was priced at about 2 times the IRP.

The lowest-priced generic products on average were 7 times the IRP, with 50 percent of the medicines being sold in the range of 3 to 19 times the reference prices. The highest-priced generic products had a larger price differential and on average were priced at 36 times the IRP. Fifty percent of the brand medicines surveyed were in the range of 9 to 92 times the IRP.<sup>\*\*\*</sup> Figure 3 illustrates these results and suggests there is considerable variation between private pharmacies, as indicated by differences seen in prices between the 25th and 75th percentiles.

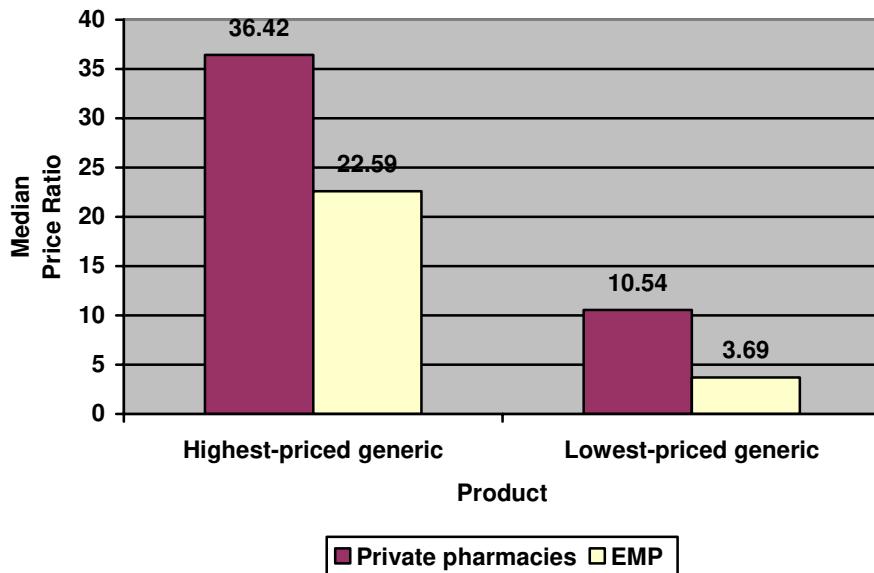
**Figure 3. Summary of median price ratios in the private sector for all 28 medicines**



This difference may be due in part to differences seen in median price ratios in the private-sector pharmacies and the EMP medicine outlets. Figure 3 does not disaggregate results by private pharmacies and EMPs, and all of these medicine outlets are analyzed together. However, when EMPs are analyzed separately, we found that median price ratios decreased (and subsequently increased in the private-sector pharmacies). While the EMPs are generally considered private, their overall prices for reproductive health medicines tend to be lower than commercial pharmacies, based on the results of this study. Figure 4 illustrates these differences. While fewer highest-priced products were available from EMPs, the availability of lowest-priced products was comparable to other commercial pharmacies.

\*\*\* A medicine price was factored into the median price ratios only if it was found in at least three private medicine outlets.

**Figure 4. Summary of median price ratios in commercial pharmacies and EMPs for all 28 medicines**

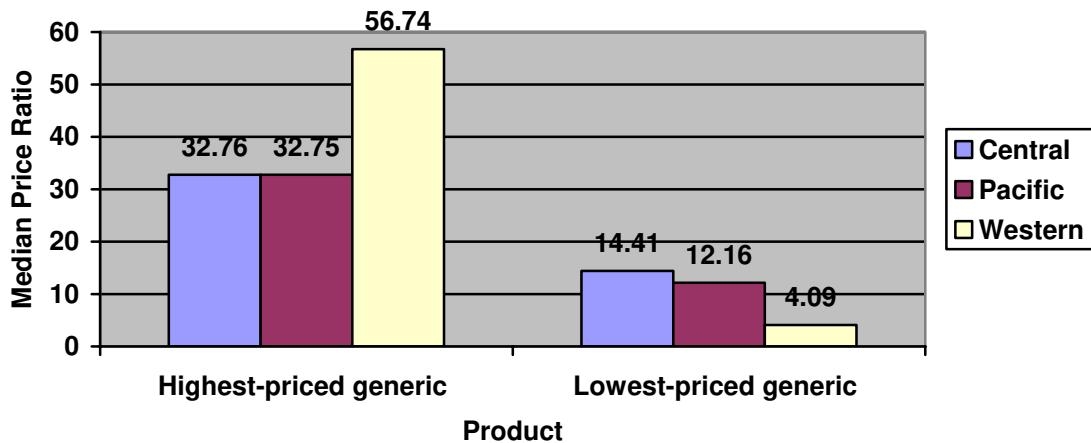


The survey identified median price variation between the lowest- and highest-priced generic price ratios by region, which are illustrated in Figure 5. However, these results are not consistent across pricing categories. Specific causes for these interregional variations are speculative at this point. Distribution costs, profit margin variations among wholesalers and retailers, demand, and region-specific income levels may all contribute to the observed price differences. However, these price variations have an effect on the affordability of, and thus access to, reproductive health products.

The survey found that the Western region (León) had the highest median price ratio for the highest-priced generic medicines, but the lowest median price ratio for the lowest-priced generic medicines. However, as there were fewer highest-priced generic medicines found in León than in Managua or Matagalpa, the median price ratio is based on a smaller number of medicines.<sup>\$\$\$</sup> On average, lowest-priced generic medicines in León were found to be about 4 times the IRP, while in the Pacific (Managua) and Central (Matagalpa) regions, they were found to be priced at almost 12 and 14.5 times the IRP, respectively. Within the scope of the survey, we cannot account for these variations.

<sup>\$\$\$</sup> There were 12 highest-priced generic products found in Managua, compared to 9 and 6 in Matagalpa and León, respectively.

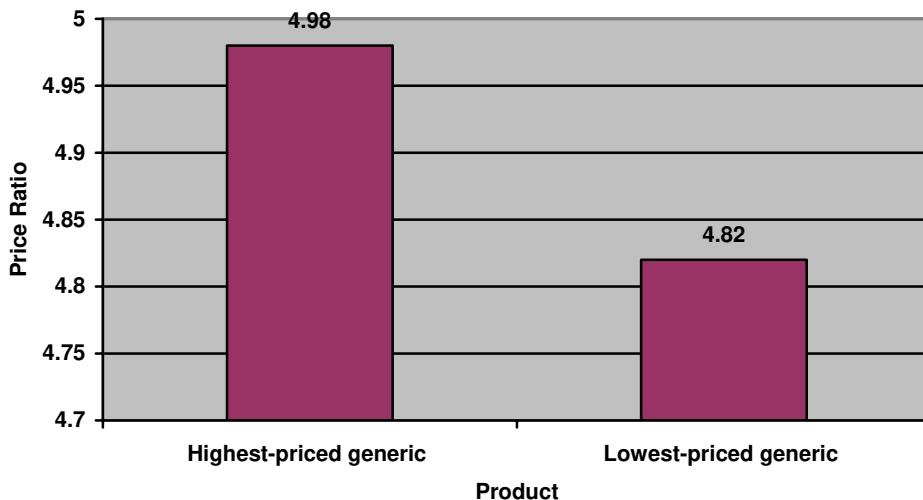
**Figure 5. Median private-sector price ratios by region**



*Patient prices in the nongovernmental sector*

Many fewer medicines were found in the NGO sector, rendering less reliable comparison ratios. As seen in Figure 6, the NGO sector analysis illustrated that there was little difference in median price ratios between lowest-priced and highest-priced generic products. Overall, lowest-priced generic products were typically priced at close to 4.8 times the IRP, while highest-priced generic products were priced at about 5 times the IRP. However, there were 2.75 times more of the lowest-priced than highest-priced generic medicines found in the NGO sector.\*\*\*\* Fifty percent of the lowest-priced generic medicines surveyed were in the range of 2.85 to 15.85 times the reference prices.

**Figure 6. Summary of median price ratios in the NGO sector for all 28 medicines**



\*\*\*\* A medicine price was factored into the median price ratios only if it was found in at least two NGO sector outlets. This number is different from the number of medicines (three) used in the private sector analysis because of the fewer number of facilities and the fewer number of medicines found overall.

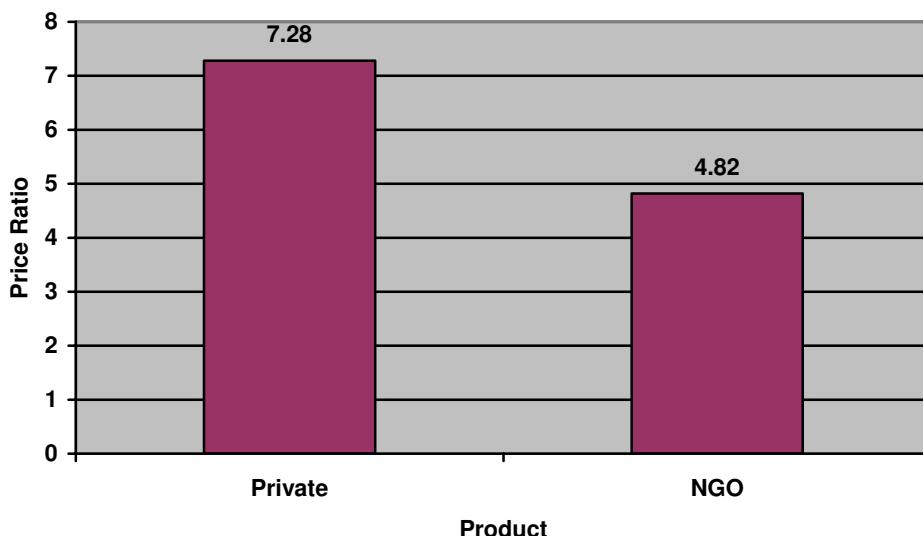
### *Patient prices in the public sector*

All 28 medicines studied were provided free of charge to patients in the public sector, so only availability—not patient price—was recorded. However, representatives in the public-sector facilities visited by the survey team provided their *procurement* prices. As expected, these prices reflected the procurement price ratios seen at the central level public procurement agency. Of the 11 products found in at least 3 of the public health outlets, the median price ratio of lowest-priced generic products was 1.2, with 50 percent of the medicines falling between 0.78 and 1.37 times the reference price. Only one highest-priced generic product was found in the public sector and it had a median price ratio of 1.

### *Patient prices across sectors*

Figure 7 illustrates the median price ratio for lowest-priced generic products across the private and NGO sectors. The median private and NGO sector ratios are relatively comparable at about 5 and 7, respectively. Only one highest-priced generic product was found in the NGO sector, so comparison between highest-priced generic median price ratios is irrelevant. The examples in Table 3 are included to illustrate the situation by showing data on individual medicines. Again, the data reveal small differences between the two sectors. In fact, oxytocin had a higher median price ratio in the NGO sector.

**Figure 7. Median lowest-priced generic product price ratios by sector**



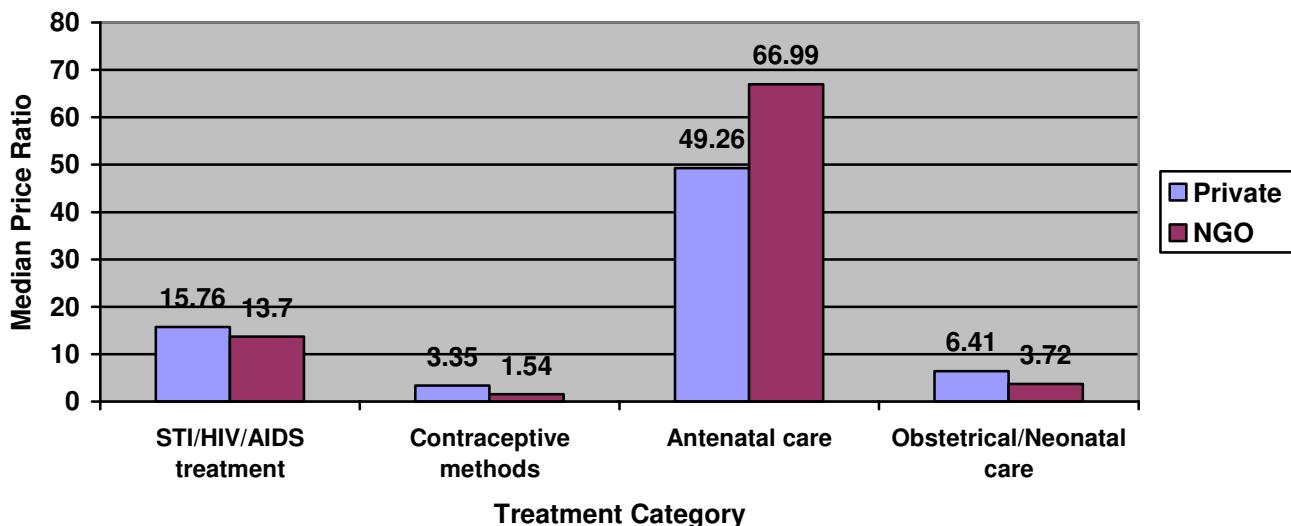
**Table 3. Comparing price ratios between the private and NGO sectors for a sample of products**

Generic name	Type	Private	NGO
Co-trimoxazole tablet (200/40mg)	Highest-price generic	9.97	Not available
	Lowest-price generic	5.16	4.81
Male condom	Highest-price generic	19.68	Not available
	Lowest-price generic	3.69	3.08
Folic acid	Highest-price generic	106.75	Not available
	Lowest-price generic	76.28	Not available
Oral pill (ethinylestradiol + norgestrel)	Highest-price generic	32.76	Not available
	Lowest-price generic	3.00	Not available
Oxytocin	Highest-price generic	Not available	Not available
	Lowest-price generic	3.42	4.82

*Patient prices by treatment category*

Figure 8 disaggregates median price ratios in the private and NGO sectors by reproductive health treatment category. Here, the numbers reflect the median price ratio of the medicines compared with the IRP. These ratios reflect the median prices of lowest-priced generic medicines available within a specific treatment category. Across the three sectors, contraceptive methods were priced lowest, followed by obstetrical/neonatal treatments. However, the availability of medicines differs dramatically by sector. In the case of STI medicines, for example, seven and six medicines are reflected in the private and NGO sector ratios, respectively (out of ten possible). For contraceptive methods, only four are reflected in the price sector and two in the NGO sector ratios (out of nine possible). Only one antenatal medicine is reflected in the NGO sector ratio (out of four possible). Two antenatal medicines are reflected in the private-sector ratio. In the obstetrical/neonatal treatment category, four and two are reflected in the private and NGO sector ratios, respectively (out of five possible).

**Figure 8. Lowest-price generic product price ratio by sector and treatment category**



### **Availability**

The medicine list used for this survey contained 28 reproductive health medicines within four major reproductive treatment categories. Products were classified as available if the medicine outlets had at least one unit ready for distribution to clients. Stock levels were not measured. There were 39 facilities surveyed, with a possible total medicine sample size of 78 when adding together both product categories (highest-priced generic and lowest-priced generic).

The overall average availability across all sectors of the highest and lowest price generic medicines was 24 percent. The very low availability of highest-priced generic products in all sectors (14 percent) brings that average down. Looking only at lowest-priced generic products, the availability improved slightly (29 percent). The average availability of lowest-priced generic and highest-priced generic products in the private sector was approximately 28 and 39 percent, respectively. Average availability of lowest-priced generic products in the public and NGO sectors was approximately 25 and 24 percent, respectively. Appendix 4 lists the availability of all 28 reproductive health products on the Nicaragua list.

The most available product was amoxicillin with about 62 percent availability overall, 100 percent availability for the lowest-priced generic product in the public and private sectors, and 86 percent availability in the NGO sector. Several products were not available in any of the sectors, including nevirapine in either syrup or tablet form and the levonorgestrel form of the progestin-only oral contraceptive pill.

Table 4 illustrates the availability of medicines by region while Figure 9 presents availability by region and sector. Overall, there was very little difference in the average availability of highest-priced generic and lowest-priced generic products between regions.

**Table 4: Average medicine availability by region (percent)**

	Highest-priced and lowest-priced generic products	Lowest-priced generic products	Highest-priced generic products
All regions	24	29	14
Central	25	30	14
Pacific	24	24	14
Western	21	24	14

**Figure 9. Average availability by sector and region**

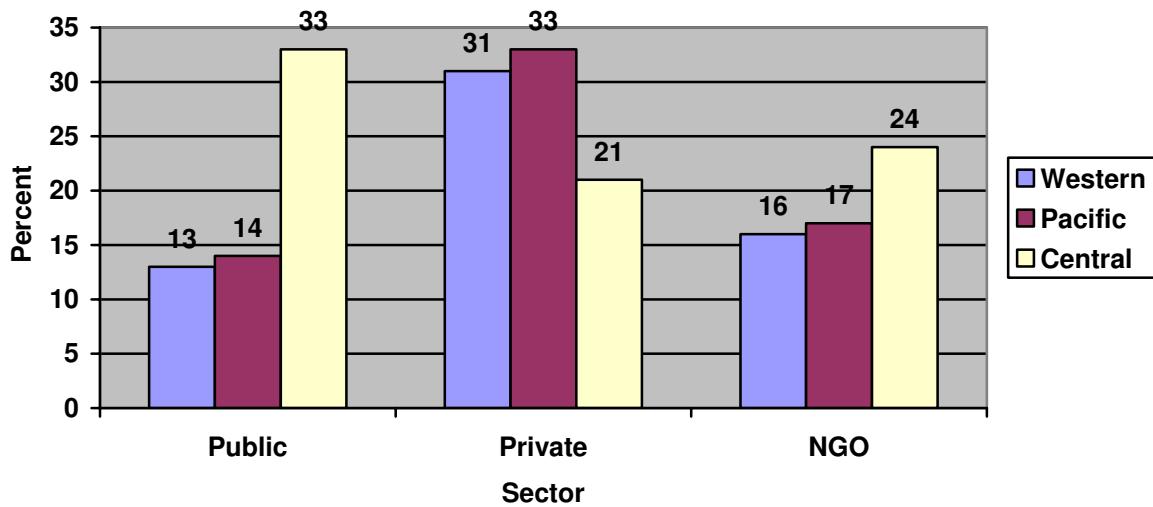
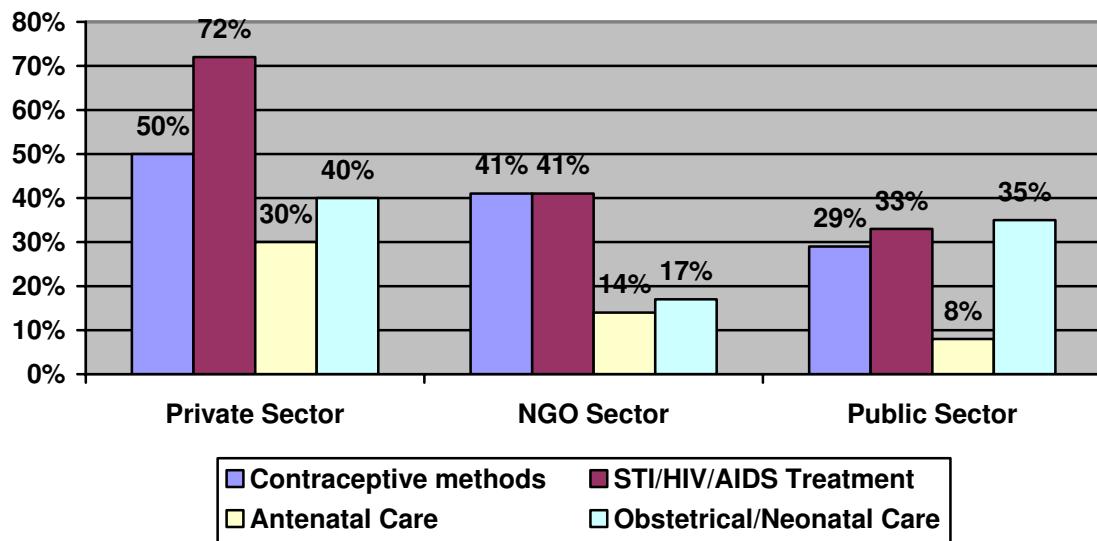


Figure 10 illustrates average medicine availability by reproductive health treatment category. Here, the numbers reflect the average number of medicines (lowest-priced generic or highest-priced generic) available within a specific treatment category. STI treatment medicines were the most available in all three sectors, followed by contraceptive methods. Antenatal medicines were the least available; private-sector outlets had only 30 percent of the possible four products, and the NGO and public sectors had only 14 percent and 8 percent, respectively, of the products.

**Figure 10. Average reproductive health medicine availability by sector**



When comparing only the prices that patients pay in each sector, the public sector—where products are provided free of charge—offers the cheapest alternative for obtaining reproductive health products. However, the survey identified significant lack of availability for reproductive health medicines. This means that many people either will have to go without treatment or spend considerably more to purchase medicines in the private sector, which offers the greatest likelihood of availability.

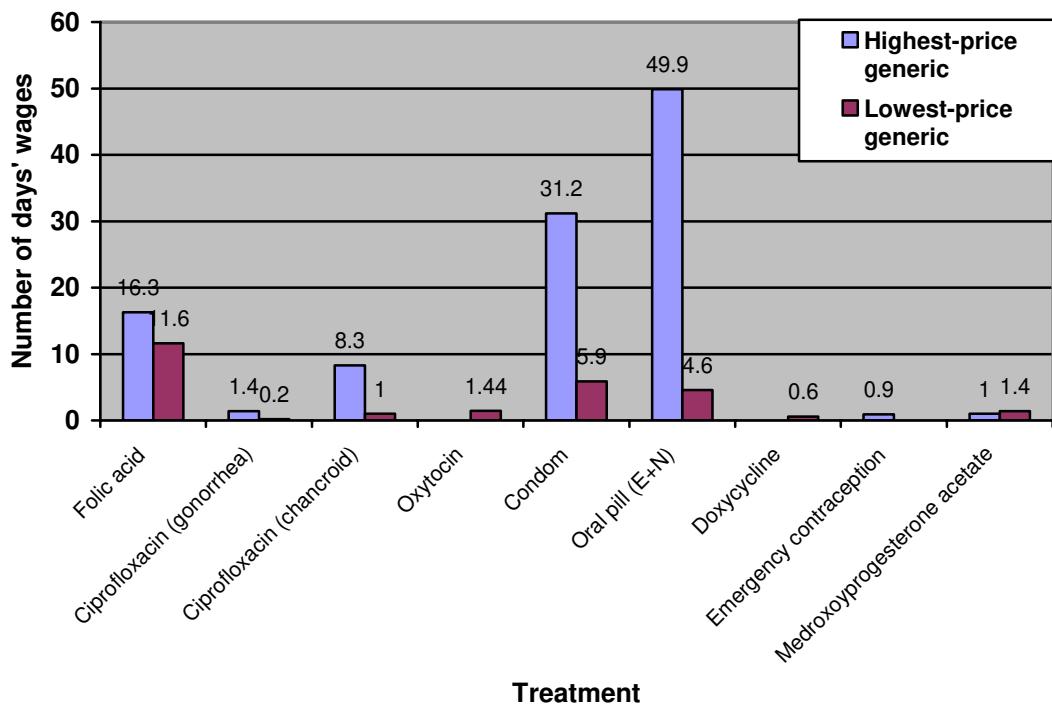
### Affordability

As noted previously, one would not expect consumers to pay IRP prices since those are based on large volume procurements. However, significant increases over the IRP prices for essential reproductive health medicines are of concern in a country like Nicaragua where purchasing power is low. The WHO/HAI methodology includes a formula for conducting an affordability analysis of the medicines researched. It involves obtaining the annual or monthly salary of the lowest-paid government worker and using that number to calculate the worker's daily wage. By multiplying the unit cost of a medicine by the total number of units needed for a particular treatment, one can calculate the total treatment cost. The cost is then divided by the daily wage in order to express the treatment cost in terms of the lowest paid government worker's daily wage. In Nicaragua, the daily wage of the lowest paid government worker is about 41 Cordobas. Expressed in US dollars, using the exchange rate from March 2005 (when this study was conducted), this figure is approximately US \$2.42. However, it is important to bear in mind that with almost 50 percent of Nicaraguans living below the poverty line and almost 50 percent being underemployed, the daily wage of the lowest paid government worker may not represent the reproductive health commodity affordability for the average citizen.

Figure 11 illustrates the number of days' wages required for the purchase of treatment medicines in the private sector for a number of products used for specific treatments. The calculations used for condoms, oral pills, and medroxyprogesterone acetate differ from that of the other treatment conditions (which typically require treatment over a defined period of time). The treatment cost was

determined by the *annual cost* of each contraceptive method. This is established by multiplying the unit price of the product by the “couple year” protection factor for each other. Couple year protection factors used in this analysis are 4 units of medroxyprogesterone acetate, 120 condoms, and 15 cycles of pills.<sup>13,††††</sup>

**Figure 11. Reproductive product affordability in days’ wages**



Using the wage calculation, a course of highest-priced ciprofloxacin to treat chancroid purchased at a private-sector facility where availability is greatest requires the equivalent of 8.3 days’ wages, but only 1 days’ wage for the lowest-priced generic product. For folic acid treatment (which includes three tablets per day for 90 days) the cost in days’ wages for the lowest-priced generic product is 11.6, while the highest-priced generic product cost is 16.3 days’ wages. For a year’s supply of oral contraceptive pills, the highest-priced generic product would cost the patient 50 days’ wages, while the lowest-priced generic product would only cost 4.6 days’ wages. Expressed in terms of percentage of annual salary, this amounts to 13.6 percent and 1.3 percent, respectively. It is important to bear in mind that these costs refer only to the medicine component of the total treatment costs. Consultation fees and diagnostic tests may mean that the total cost to the patient is considerably higher.

A recent diagnostic study on contraceptive security carried out by the JSI/DELIVER Project and local partners examined market segmentation of contraceptive methods used in Nicaragua.<sup>14</sup> Results

†††† The median price ratios for medroxyprogesterone acetate were not consistent with the median price ratios for the other medicines studied. The wide variability in cost of the innovator brand product (from 22 to 139 Cordobas) in private sector pharmacies created a price ratio below that of the relatively consistently priced generic product (42 to 67 Cordobas) which is why the days’ wages calculation suggested the “high-priced” product costs less than the “low-priced” product.

from this study expand upon what was found in the pricing survey for contraceptive methods. This study found inequalities in contraceptive prevalence rates (CPR) and unmet need for contraceptive methods between the rich and poor. In the poorest quintile of the population, unmet need was highest at 25 percent and CPR was lowest at 50 percent. Conversely, unmet need was lowest among the richest quintile at 10 percent.<sup>14</sup> These findings dovetail with the results of the pricing study where the public sector's intention of providing a safety net is evident in the offer of reproductive health products free of charge. The reality, however, is a striking lack of availability. The private sector, while offering greater availability, may not be a viable alternative for the poorest people due to medicine prices.

## **Discussion**

The results showed that one of the biggest challenges in Nicaragua to accessing reproductive health medicines is that the availability of many of the essential products is inadequate and the prices of these medicines are inconsistent and relatively high relative to earning power. This survey shows large price differences in the private-sector pharmacies between highest-priced generic or innovator brand products and their lowest-priced generic equivalents. The differences in price between higher and lower-priced generic equivalents were found to be as high as 11 times in some instances. One item found in a private-sector pharmacy was found to be 695 times that of the international reference price. The findings also suggest that prices show considerable variation between individual private pharmacies, as indicated by differences seen in prices between the 25th and 75th percentiles.

Average availability of STI/HIV/AIDS treatment products in the private sector was fairly dependable at 72 percent. However, on average only half of the contraceptive methods could be found in any one pharmacy and even fewer of the obstetrical/neonatal and antenatal medicines could be found. Even if a product was available, it may not have been affordable, making it inaccessible to many people.

The NGO sector is often considered an affordable alternative to private-sector pharmacies. However, our research showed that the patient prices in this sector were comparable to those found in the private pharmacies. In addition, availability of the reproductive health medicines studied was similar to the public sector.

The study found that procurement in the public sector is efficient and products in the public sector are provided free of charge. However, availability is a serious problem, which means that for these products no reliable safety net exists to ensure access of the poor to essential reproductive health medicines. On average, less than one third of the contraceptive methods, STI/HIV/AIDS treatment medicines, and obstetrical/neonatal medicines were found in the public-sector hospitals and clinics. Possible explanations for the lack of availability in the public sector include inefficiency in the public sector and a lack of funding.

USAID has been the principal supplier of public-sector contraceptives to Nicaragua since 1995, supplying about 60 percent of the MOH's contraceptive needs.<sup>9</sup> However, USAID's contraceptive donations will decline rapidly after 2005.<sup>9</sup> With high rates of unintended pregnancy and a public

health system that supplied 63 percent of family planning methods in 2001, the contraceptive market is extremely vulnerable.<sup>9</sup> In addition, a 2004 study showed that the wealthiest two quintiles are not accessing the private sector to the extent expected and instead are seeking services in the public sector.<sup>14</sup> As a result, there is an increasingly critical need to strengthen contraceptive services in the private sector and encourage those who can afford the private-sector prices to have confidence in and use these services.

### ***Limitations of the research***

The low availability of medicines included in this study, particularly in the public sector but also in some private-sector pharmacies, affects the reliability of the data. Given this, there is concern that the research is not representative of the situation in Nicaragua. However, the large price variations suggest that the study conclusions are relevant.

Dispensing doctors in the private sector are also a concern. The size of this sector and the prices charged are not known and should be studied using exit interviews or household surveys. In addition, the current study only looks at pricing and availability of medicines, not quality. If medicine quality is considered a possible problem, it could be addressed in any follow up to the study. Lastly, this study did not examine price composition, which would compare aspects of the overall pricing structure.

### ***Conclusions and recommendations***

The principal conclusions of the study are that Nicaragua's public health sector is relatively efficient in procurement and charges no price to patients, but also makes no distinction on ability to pay. In addition, the availability of medicines in the public sector is far from optimal and many people are forced either to rely on the private sector or go without treatment. An extended survey should be undertaken to ascertain the reasons for the low availability of medicines in the public sector.

Relative to the IRP and income, prices are often high in the private sector and NGO sectors. Brand premiums between the highest-priced generic or innovator brand products and their lowest-priced generic equivalents are also often high. An in-depth study of the private sector should be initiated to investigate the following:

- Prescribing practice, including whether high-priced generic or innovator brand products are more frequently prescribed than the lower-priced generic equivalents.
- Discrepancies between private-sector retail prices measured in this survey, based on information from pharmacists, and the prices people actually pay, based on exit interviews or household surveys.
- The size of the “dispensing doctors” sector.

This study, using basic indicators only, cannot give a complete picture of the pharmaceutical sector in Nicaragua. However, it is our hope that the findings and recommendations of this report will be studied and will form the basis for an in-depth examination of ways to improve access to and affordability of medicines for all.

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## Appendix 1. List of surveyed reproductive health medicines

Generic name	Dosage form	Dose
1. Amoxicillin	Tablet	500mg
2. Benzathine benzylpenicillin	Vial	1.44g/2.4 million IU
3. Ciprofloxacin	Tablet	500mg
4. Condom (male)	Condom	52mm
5. Co-trimoxazole	Tablet	800/160mg
6. Co-trimoxazole	Tablet	200/40mg
7. Doxycycline	Tablet	100mg
8. Ergometrine	Tablet	.2mg
9. Ergometrine	Injection	.2mg/1 ml
10. Female condom	Condom	
11. Folic acid	Tablet	5mg
12. Iron	Tablet	60mg
13. IUD	IUD	IUD
14. Levonorgestrel	Tablet	.75mg
15. Magnesium sulfate	Injection	500mg/2ml or 10ml
16. Medroxyprogesterone acetate	Vial	150mg/3 month
17. Metronidazole	Tablet	200–500mg
18. Metronidazole	Vial	500mg/100ml
19. Misoprostol	Tablet	100mg
20. Nevirapine	Syrup	50mg/5ml
21. Nevirapine	Tablet	200mg
22. Oral pill, combined (ethinylestradiol + norgestrel)	Tablet	.03/.03mg
23. Oral pill, combined (ethinylestradiol + levonorgestrel)	Tablet	.03/.15mg
24. Oral pill (progestogen only) levonorgestrel	Tablet	.03mg
25. Oral pill (progestogen only) norgestrel	Tablet	.075mg
26. Oxytocin	Injection	10 IU/1 ml
27. Sulfadoxine + pyrimethamine	Tablet	500mg/25mg
28. Tetanus toxoid vaccine	Vial	.5ml

## Appendix 2. Medicine price data collection form

### Medicine Price Data Collection Form

	A Generic name, dosage form, strength	B Brand name(s)	C Manufacturer	D Available (tick ✓ for yes)	E Pack size recommended	F Pack size found	G Price of pack found	H Unit price (4 digits)	I Comments
#									
1	<b>Benzathine benzylpenicillin powder (injection) 1.44g/2.4 millones IU</b>  Lowest-priced generic equivalent								
2	<b>Condom (male)</b>  Lowest-priced generic equivalent								
3	<b>Co-trimoxazole (tablet) 400mg/80mg</b>  Lowest-priced generic equivalent								
4	<b>Co-trimoxazole (tablet) (220mg/40mg)</b>  Lowest-priced generic equivalent								
5	<b>Doxycycline (capsule) 100mg</b>  Lowest-priced generic equivalent								
6	<b>Ergometrine (tablet 2mg)</b>  Lowest-priced generic equivalent								
7	<b>Ergometrine (injection) 0.2mg x ml</b>  Lowest-priced generic equivalent								
8	<b>Condom (female)</b>  Lowest-priced generic equivalent								
9	<b>Folic acid (tablet) 5 mg</b>  Lowest-priced generic equivalent								
10	<b>Iron (tablet) 60 mg</b>  Lowest-priced generic equivalent								
11	<b>IUD</b>  Lowest-priced generic equivalent								
12	<b>Levonorgestrel (tablet) 0.75 mg</b>  Lowest-priced generic equivalent								
13	<b>Magnesium sulfate (injection) 500 mg/2ml</b>  Lowest-priced generic equivalent								
14	<b>Medroxyprogesterone acetate (injection) 150 mg</b>  Lowest-priced generic equivalent								

15	<b>Metrodinazole (injection) 5mg/ml mg 3 mes</b>									
16	Lowest-priced generic equivalent <b>Metrodinazole (tablet) 500 mg</b>									
	Lowest-priced generic equivalent									
17	<b>Misoprostol (tablet) 100 mg</b>									
	Lowest-priced generic equivalent									
18	<b>Nevirapine (syrup) 50mg/5ml</b>									
	Lowest-priced generic equivalent									
19	<b>Nevirapine (tablet) 200mg</b>									
	Lowest-priced generic equivalent									
20	<b>Oral pill, combined ethinylestradiol + levonorgestrel (tablet) .03/15mg</b>									
	Lowest-priced generic equivalent									
21	<b>Oral pill, combined ethinylestradiol + norgestrel (tableta) .03/.03 mg</b>									
	Lowest-priced generic equivalent									
22	<b>Oral pill, Progestogen only Levonorgestrel 0.03 mg</b>									
	Lowest-priced generic equivalent									
23	<b>Oral pill, Progestogen Norgestrel 0.5 mg</b>									
	Lowest-priced generic equivalent									
24	<b>Oxytocin (injection)</b>									
	Lowest-priced generic equivalent									
25	<b>Sulfadoxine + pyrimethamine (tablet) 500mg/25mg</b>									
	Lowest-priced generic equivalent									
26	<b>Tetanus toxoid vaccine (injection) .5ml</b>									
	Lowest-priced generic equivalent									
27	<b>Amoxicillin (capsule) 500mg</b>									
	Lowest-priced generic equivalent									
28	<b>Ciprofloxacin (tablet) 500 mg</b>									
	Lowest-priced generic equivalent									

### Appendix 3. International reference prices of the 28 medicines surveyed

<b>Generic name</b>	<b>Dosage form</b>	<b>Dose</b>	<b>2004 MSH unit price (\$US)<sup>12</sup></b>
Amoxicillin	Tablet	500mg	\$0.0295
Benzathine benzylpenicillin	Vial	1.44g/2.4 million IU	\$0.0238
Ciprofloxacin	Tablet	500mg	\$0.0253
Condom (male)	Condom	52mm	\$0.0328
Co-trimoxazole	Tablet	800/160 mg	\$0.0068
Co-trimoxazole	Tablet	200/40mg	\$0.0034
Doxycycline	Tablet	100mg	\$0.0084
Ergometrine	Tablet	.2mg	\$0.0017
Ergometrine	Injection	.2mg/1 ml	\$0.2066
Female condom	Condom		\$0.9250
Folic acid	Tablet	5mg	\$0.0014
Iron	Tablet	60mg	\$0.0023
IUD	IUD	IUD	\$1.2962
Levonorgestrel	Tablet	.75mg	\$0.2878
Magnesium sulfate	Injection	500mg/2ml or 10ml	\$0.0574
Metronidazole	Tablet	200–500mg	\$1.0039
Metronidazole	Vial	500mg/100ml	\$0.0052
Misoprostol	Tablet	100mg	\$0.0030
Medroxyprogesterone acetate	Vial	150mg/3 month	\$0.0100
Nevirapine	Syrup	50mg/5ml	\$0.0239
Nevirapine	Tablet	200mg	\$0.4030
Oral pill, combined (ethinylestradiol + norgestel)	Tablet	.03/.03mg	\$0.2645
Oral pill, combined (ethinylestradiol + levonorgestrel)	Tablet	.03/.15mg	\$0.2519
Oral pill (progestogen only) levonorgestrel	Tablet	.03mg	\$0.3945
Oral pill (progestogen only) norgestrel	Tablet	.075mg	\$0.2284
Oxytocin	Injection	10 IU/1 ml	\$0.1256
Sulfadoxine + pyrimethamine	Tablet	500mg/25mg	\$0.0212
Tetanus toxoid vaccine	Vial	.5ml	\$0.9780

## Appendix 4: Medicine availability in Nicaragua outlets

Medicine name	Medicine availability in outlets						Average # outlets with medicine (n=78)	
	Brand			Lowest price				
	Public (n=13)	Private (n=19)	Other (n=7)	Public (n=13)	Private (n=19)	Other (n=7)		
	% Avail	% Avail	% Avail	% Avail	% Avail	% Avail	% Avail	
Amoxicillin	7.7%	47.4%	0.0%	100.0%	100.0%	85.7%	<b>61.6%</b>	
Benzathine benzylpenicillin	0.0%	31.6%	0.0%	0.0%	47.4%	0.0%	<b>19.2%</b>	
Ciprofloxacin	0.0%	47.4%	0.0%	38.5%	100.0%	85.7%	<b>50.0%</b>	
Condom (male)	0.0%	26.3%	0.0%	69.2%	89.5%	71.4%	<b>46.2%</b>	
Co-trimoxazole	0.0%	52.6%	0.0%	0.0%	100.0%	42.9%	<b>41.0%</b>	
Co-trimoxazole (2)	0.0%	42.1%	0.0%	84.6%	94.7%	42.9%	<b>51.3%</b>	
Doxycycline	0.0%	10.5%	0.0%	53.8%	94.7%	71.4%	<b>41.0%</b>	
Ergometrine	0.0%	10.5%	0.0%	0.0%	0.0%	0.0%	<b>2.6%</b>	
Ergometrine injection	0.0%	5.3%	0.0%	69.2%	52.6%	57.1%	<b>30.8%</b>	
Female condom	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	<b>0.0%</b>	
Folic acid	0.0%	78.9%	14.3%	0.0%	52.6%	28.6%	<b>35.9%</b>	
Iron	0.0%	5.3%	0.0%	0.0%	10.5%	0.0%	<b>3.9%</b>	
IUD	0.0%	0.0%	14.3%	69.2%	15.8%	42.9%	<b>20.5%</b>	
Levonorgestrel	0.0%	73.7%	57.1%	0.0%	0.0%	0.0%	<b>23.1%</b>	
Magnesium sulfate	0.0%	0.0%	0.0%	38.5%	47.4%	0.0%	<b>18.0%</b>	
Medroxyprogesterone acetate	92.3%	78.9%	57.1%	0.0%	36.8%	0.0%	<b>48.7%</b>	
Metronidazole injection	0.0%	68.4%	0.0%	15.4%	10.5%	0.0%	<b>21.8%</b>	
Metronidazole tablets	0.0%	42.1%	14.3%	0.0%	89.5%	85.7%	<b>41.0%</b>	
Misoprostol	0.0%	5.3%	0.0%	0.0%	21.1%	0.0%	<b>6.4%</b>	
Nevirapine syrup (ml)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	<b>0.0%</b>	
Nevirapine tablets	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	<b>0.0%</b>	
Oral pill (E+L)	7.7%	89.5%	85.7%	0.0%	5.3%	0.0%	<b>32.1%</b>	
Oral pill (E+N)	0.0%	31.6%	14.3%	61.5%	42.1%	14.3%	<b>30.8%</b>	
Oral pill (levonorgestrel)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	<b>0.0%</b>	
Oral pill (norgestrel)	0.0%	36.8%	28.6%	0.0%	0.0%	0.0%	<b>11.5%</b>	
Oxytocin	0.0%	0.0%	0.0%	69.2%	63.2%	28.6%	<b>29.5%</b>	
Sulphadoxine + pyrimethamine	0.0%	0.0%	0.0%	7.7%	5.3%	0.0%	<b>2.6%</b>	
Tetanus toxoid vaccine	0.0%	0.0%	0.0%	23.1%	0.0%	14.3%	<b>5.1%</b>	
<b>Averages</b>	<b>3.9%</b>	<b>27.6%</b>	<b>10.2%</b>	<b>25.0%</b>	<b>38.9%</b>	<b>24.0%</b>	<b>24.1%</b>	
<b>Average lowest-priced generic availability</b>							<b>29.2%</b>	
<b>Average highest-priced generic availability</b>							<b>13.9%</b>	