

# Studies of Drug Prescribing Practices as a Requirement for a Certificate Course on Rational Medicine Use



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## Background

The Universidad Central del Este de República Dominicana (Central University of the Eastern Dominican Republic) conducted a certificate course on rational medicine use in 2016 with help from the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program, financed by the US Agency for International Development. Its blended training method allowed 32 students to strengthen their theoretical knowledge with operational research in the workplace and classroom discussions of their findings and options for addressing problems detected.

As part of the “Medicine Use Studies” module, the students conducted seven *prescription/indication* use studies at primary (level one) health care facilities and hospitals, which were then assembled into the final report for the certificate course.

## Methodology

As part of the “Strategies for Improving Medicine Use” module, the students conducted Pareto (ABC) analyses of the medicines consumed in 2015 by the facilities to which they were assigned for their on-the-job training. Their classroom presentations and discussions of their findings led to the identification of consumption patterns seemingly inconsistent with best practices for the treatment of pathologies. The medicines subjected to *prescription/indication* use studies were among the 10 products with the highest consumption values at all the primary health care facilities (amoxicillin + clavulanic acid and Bromhexine) and hospitals (human albumin and ceftriaxone) covered by the analysis or at selected hospitals (imipenem and midazolam). An antiretroviral medicine was also selected for study based on the interest expressed in its inclusion by students and instructors.

The students were provided with written materials and basic training on the importance, design, implementation, and presentation of *prescription/indication* use studies. With the help of the instructors and predesigned templates, they developed a study protocol; collected, processed, and analyzed the data; and presented their findings at classroom sessions.

A total of seven descriptive, retrospective, cross-sectional *prescription/indication* use studies were conducted at five hospitals and primary (level one) health care centers operated by two Regional Health Services. The unit of analysis was the case files of patients for whom the medicine selected for study had been prescribed. The time constraints imposed by the length of

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the certificate course necessitated using a purposive sample. An average of 111 case files from 2015 were randomly selected for study at each facility.

For each medicine included in the study, the students compared the prescriptions recorded in the case files with the indications in national and international guidelines and protocols for the same product. For a prescription to be considered as “conforming” to the standard, it had to be appropriate for the indication or problem in question and its use consistent with standard dosage, frequency of administration, and length of treatment. Prescriptions failing to meet any of these parameters were considered “nonconforming.” The last step was to estimate spending on nonconforming prescriptions.

## Findings

A total of 777 case files from 2015 were analyzed at five hospitals and two primary (level one) health care centers. The medicines selected for study at the hospitals were imipenem/cilastatin 500 mg, 20 ml vials; lopinavir + ritonavir, 200 mg + 50 mg tablets; ceftriaxone, 1 gram vials; midazolam, 5 mg ampoules; and albumin 20% solution, 50 ml vials. The medicines studied at primary health care centers were amoxicillin + clavulanic acid, 250 mg + 62.5 mg suspension, 120 ml vials, and Bromhexine syrup, 4 mg/5 ml.

One hundred percent of the prescriptions for three of the seven medicines (lopinavir + ritonavir, amoxicillin + clavulanic acid, and Bromhexine) were nonconforming (table 1). The prescriptions for the antiretroviral medicine and Bromhexine failed to record the posology (dosage, frequency of administration, and length of treatment) in the case files. Amoxicillin + clavulanic acid was prescribed for viral or undetermined diseases in 66% of the cases. The rest of the prescriptions failed to indicate the posology.

Fifty-six percent of the prescriptions for ceftriaxone and 90% of the prescriptions for albumin were nonconforming. In the case of both medicines, national and international protocols did not recommend their use for the pathologies or conditions for which they were prescribed in the case files studied. Midazolam was the only one of the seven medicines studied for which 100% of all prescriptions were conforming. Total spending for nonconforming medicine use was estimated at DOP 3,550,739 (equivalent to USD 78,905) for one year.

## Analysis and Discussion

Using the knowledge and practical skills acquired in the certificate course, the students conducted *prescription / indication* studies to assess the quality of high-consumption drug use at the health facilities in which they worked. In most cases, the studies found the quality of drug use inadequate, resulting in the inefficient use of resources. Weaknesses identified included noncompliance with therapeutic guidelines or protocols and principles of good prescribing practices. The findings revealed a need for the implementation of strategies for improving adherence to national or international therapeutic standards and ensuring the proper completion of case files in accordance with good prescribing practices. This work should be headed up by the pharmacy and therapeutics (P&T) committees formed as part of the certificate course at all the facilities involved in the study process.

The certificate course on rational drug use was conducted based on a constructivist *learning by doing* approach in which the students were able to apply their newly acquired knowledge in

their workplace. The *prescription / indication* studies reinforced the students' knowledge and provided evidentiary data for improving prescribing practices at both the individual facility and throughout the Dominican Republic's health care system.

**Table 1. 2015: Percentage and cost of "non-conforming" prescriptions in seven drug use studies conducted as part of the certificate course on rational drug use**

No	Drug	Health Unit / Region	Sample	% of "non-conforming" prescriptions	Spending on non-conforming prescriptions	
					RD\$	USD
1	Imipenem Cilastatin, 500 mg, 20 ml vial	Padre Billini Teaching Hospital	51	92.0%	1,609,772	35,773
2	Lopinavir + Ritonavir, 200 mg + 50 mg tablet	Comprehensive Care Unit at Juan Pablo Pina Regional University Hospital, San Cristóbal	60	100.0%	324,864	7,219
3	Ceftriaxone, 1 gr. vial	Pulmonology, Neurology, Infectious Diseases, and Orthopedics Units at Dr. Arturo Grullón Children's Hospital, Santiago	160	56.3%	88,546	1,968
4	Midazolam, 5 mg ampoule	Department of Surgery and ICU at Nuestra Señora de la Altagracia University Maternity Hospital	120	0%	0	-
5	Albumin 20% solution, 50 ml vial	Gastroenterology and Internal Medicine Departments, ICU, and Nephrology Unit at Dr. Francisco Moscoso Puello Hospital	81	90.0%	1,519,353	33,763
6	Amoxicillin + Clavulanic acid, 250 mg + 62.5 mg suspension, 120 ml vial	El Valle Regional Health Service VI	123	100.0%	6,395	142
7	Bromhexine syrup, 4 mg/5 ml	Primary (level one) health centers in Health Region 2	182	100.0%	1,810	40
<b>Total</b>			<b>777</b>		<b>3,550,739</b>	<b>78,905</b>
<b>Average</b>			<b>111</b>	<b>77%</b>		

Source: Case files for 2015 containing prescriptions for the drugs covered by the study at the health facility in question

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**ABOUT SIAPS** | The Systems for Improved Access to Pharmaceuticals and Services (SIAPS) program works to assure access to quality pharmaceutical products and effective pharmaceutical services through systems-strengthening approaches to achieve positive and lasting health outcomes. SIAPS is funded by the US Agency for International Development (USAID) and is implemented by Management Sciences for Health.

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