

Differences in the availability of medicines for chronic and acute conditions in the public and private sectors of developing countries

Alexandra Cameron,^a Ilse Roubos,^b Margaret Ewen,^c Aukje K Mantel-Teeuwisse,^b Hubertus GM Leufkens^b & Richard O Laing^a

Objective To investigate potential differences in the availability of medicines for chronic and acute conditions in low- and middle-income countries.

Methods Data on the availability of 30 commonly-surveyed medicines – 15 for acute and 15 for chronic conditions – were obtained from facility-based surveys conducted in 40 developing countries. Results were aggregated by World Bank country income group and World Health Organization region.

Findings The availability of medicines for both acute and chronic conditions was suboptimal across countries, particularly in the public sector. Generic medicines for chronic conditions were significantly less available than generic medicines for acute conditions in both the public sector (36.0% availability versus 53.5%; $P=0.001$) and the private sector (54.7% versus 66.2%; $P=0.007$). Antiasthmatics, antiepileptics and antidepressants, followed by antihypertensives, were the drivers of the observed differences. An inverse association was found between country income level and the availability gap between groups of medicines, particularly in the public sector. In low- and lower-middle income countries, drugs for acute conditions were 33.9% and 12.9% more available, respectively, in the public sector than medicines for chronic conditions. Differences in availability were smaller in the private sector than in the public sector in all country income groups.

Conclusion Current disease patterns do not explain the significant gaps observed in the availability of medicines for chronic and acute conditions. Measures are needed to better respond to the epidemiological transition towards chronic conditions in developing countries alongside current efforts to scale up treatment for communicable diseases.

Abstracts in **عربي**, **中文**, **Français**, **Русский** and **Español** at the end of each article.

Introduction

Chronic, noncommunicable diseases such as cardiovascular diseases, diabetes and asthma impose a large and growing health burden on developing countries.¹ Chronic diseases are responsible for at least 50% of the deaths that occur in all World Health Organization (WHO) regions except Africa, where they still account for 25% of all deaths. While the proportion of deaths from chronic diseases is largest in high-income countries, in low- and middle-income countries chronic diseases continue to cause 39% and 72% of all deaths, respectively.² Cardiovascular diseases alone account for 30% of all deaths in the world,² 80% of which occur in low- and middle-income countries.¹ It has been estimated that an additional reduction of 2% annually in deaths from chronic conditions would avert 28 million deaths in low- and middle-income countries between 2005 and 2015.³ Chronic conditions also cause substantial morbidity in terms of disability-adjusted life years (DALYs), a measure of the potential life lost due to premature mortality and of the productive life lost due to disability. Chronic conditions account for one third of DALYs in low-income countries and for nearly two thirds in middle-income countries.² In Africa, where chronic disease morbidity is lowest, these conditions still account for 21% of DALYs.

Developing countries undergoing an epidemiological transition from infectious and parasitic diseases to chronic diseases

require health systems modifications to address the long-term nature of chronic conditions, in addition to prevention efforts. The WHO Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases recommends addressing management in the context of overall health system strengthening.⁴ Continuous access to essential medicines, with an emphasis on rational selection, affordable prices and sustainable financing, should be a key component of the policy framework.¹ Appropriate pharmacological treatment has been shown to significantly reduce morbidity and mortality from chronic conditions,^{5–9} yet the necessary medicines are not equitably distributed or used as widely as required.³

Several studies have found that low drug availability limits access to medicines in low- and middle-income countries.^{10–18} Cameron et al. investigated the availability of 15 generic medicines used for a range of conditions in 36 developing countries and found it to be 38% and 64% in the public and private sectors, respectively.¹¹ Studies focused on medicines used to treat chronic conditions have shown similar results.^{19–25} However, no studies to date have investigated whether medicines for chronic conditions are less available than medicines in other therapeutic categories. We hypothesized that in countries with weak health systems that have historically focused on infectious diseases, medicines for chronic conditions requiring ongoing management are less available than

^a Essential Medicines and Pharmaceutical Policies, World Health Organization, 20 Avenue Appia, CH-1211 Geneva 27, Switzerland.

^b Utrecht Institute for Pharmaceutical Sciences, Utrecht University, Utrecht, Netherlands.

^c Health Action International – Global, Amsterdam, Netherlands.

Correspondence to Alexandra Cameron (e-mail: camerona@who.int).

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medicines used to treat acute episodes of illness. This study investigates potential differences in the availability of medicines for chronic and acute conditions in low- and middle-income countries.

Methods

Data source

Data were obtained from drug price and availability surveys conducted using a standard, validated methodology developed by WHO and Health Action International (HAI).^{26–28} In the survey, the availability of 50 medicines was investigated through visits to public and private sector facilities. Data were collected on standard medicines that enable international comparisons and on medicines selected by each country for their importance nationally (e.g. drugs for high-burden diseases). Availability was determined for: (i) the originator brand first authorized worldwide for marketing (normally as a patented product) on the basis of the documentation of its efficacy, safety and quality, according to requirements at the time of authorization; and (ii) generic equivalents intended to be interchangeable with the originator brand product. Availability is reported as the percentage of facilities where a product was found on the day of data collection. The difference or gap in availability was calculated by subtracting the availability of medicines for chronic conditions from the availability of medicines for acute conditions.

Survey inclusion

All surveys conducted following the WHO/HAI method and included in the HAI database²⁹ on 24 September 2009 were considered for inclusion, with the exception of nine pilot surveys that measured availability using different methods. In countries where repeat surveys were conducted, the most recent data set was used. In countries where multiple surveys were conducted at the state/provincial level, results were averaged without weighting. In total 50 surveys conducted in 40 countries between 2003 and 2008 were included in the analysis, yielding a sample of 2779 medicine outlets (Table 1).

Medicine selection

Any medicine covered in at least one survey was considered for inclusion and was classified as being for either acute or chronic treatment according to its primary indication for use. In accordance with methods published previously,¹¹ the 15 medicines

most frequently covered in WHO/HAI surveys for acute and chronic conditions were included in the analysis to maximize the comparability of data across countries. Such medicines are effective based on the evidence, are used to treat high-burden conditions and are widely used internationally.^{26,27}

Data analysis

The per cent availability of each medicine was extracted for both originator brand and generic products in both the public and private sectors. When alternate strengths of the same medicine were included in a survey, the availability of each of the two strengths was combined on a facility-by-facility basis to determine the overall availability of the medicine. Alternate strengths were only combined when used for the same indication; adult and paediatric dosage forms were kept separate.

Availability was analysed for: (i) the originator brand, (ii) the generic equivalent and (iii) any product (brand or generic). For the last category, the availability of originator brands and generics was combined on a facility-by-facility basis to determine the overall availability of each medicine.

The mean availability of each basket of medicines (for acute and chronic conditions) was calculated and, as data were normally distributed, the unpaired *t*-test was used to test the difference in mean availability between baskets. As availability was measured in the same facilities in each country, confounding factors such as facility type and location were eliminated. To investigate whether the availability of medicines for chronic conditions differed by indication, the mean availability of each therapeutic class represented in this medicines basket was calculated and compared with the mean availability of the 15 medicines in the acute conditions basket.

To examine potential differences in medicine availability by country income status, data were analysed by World Bank country income groups effective from 1 July 2009: low-income countries, lower-middle-income countries, upper-middle-income countries and high-income countries.³⁰ Results were also aggregated by WHO Region: African (AFR), Americas (AMR), European (EUR), Eastern Mediterranean (EMR), South-East Asia (SEAR) and Western Pacific (WPR). Due to the small number of countries in some categories, results are descriptive only. To investigate any relationship between per

cent availability of acute and chronic medicine baskets and level of income disparity, availability was analysed as a function of country Gini index, which measures the extent to which income distribution among individuals and households within an economy deviates from being perfectly equal.³¹

Results

Table 2 shows the 30 medicines included in the analysis. In the basket of medicines used to treat acute conditions, the frequency with which individual medicines were included in WHO/HAI surveys ranged from 24% to 100%; in the basket of medicines for chronic conditions, it ranged from 72% to 100%. This is not an indication of medicine availability at individual facilities, but rather, of greater consistency in the selection of chronic disease medicines for inclusion in individual surveys. With the exception of the combination sulfadoxine plus pyrimethamine, medicines for the treatment of human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS), tuberculosis and malaria are notably absent. These treatments are usually provided through vertical programmes that address specific health problems and consequently are often excluded from WHO/HAI surveys.

In the public sector, the mean availability of generic medicines was low for both baskets: 53.5% for medicines for acute conditions and 36.0% for medicines for chronic conditions, with medicines for acute conditions significantly more available ($P=0.001$) (Table 3). Originator brands of medicines in both the acute and chronic condition baskets were rarely available in the public sector. When product types were combined to yield the availability of any given product (originator brand or generic) at each facility, the difference in availability between the two baskets (14.3%) remained statistically significant ($P=0.009$).

In the private sector, the mean availability of generics in each basket was higher than in the public sector (66.2% for generics for acute conditions and 54.7% for generics for chronic conditions), but it was still low. The availability of generic products differed significantly between the two baskets (11.5%; $P=0.007$), but the availability of originator brands was the same (39.1%). The difference in the availability of any product type (originator or generic) was 5.6% ($P=0.070$).

Table 1. Surveys included in secondary analysis of data in study comparing the availability of medicines for chronic and acute conditions in 40 developing countries

| Country (survey date) | No. of facilities surveyed ^a | WHO region | WB income group ^b |
|---|---|-----------------------|------------------------------|
| Cameroon (07/2005) | 40 | Africa | Lower-middle |
| Chad (05/2004) | 35 | Africa | Low |
| China, Shandong province (10/2004) | 40 | Western Pacific | Lower-middle |
| China, Shanghai (09/2004) | 50 | Western Pacific | Lower-middle |
| Colombia (10/2008) | 59 | Americas | Upper-middle |
| Congo (07/2007) | 50 | Africa | Lower-middle |
| El Salvador (11/2006) | 104 | Americas | Lower-middle |
| Ethiopia (09/2004) | 59 | Africa | Low |
| Fiji (09/2004) ^c | 36 | Western Pacific | Upper-middle |
| Ghana (10/2004) | 84 | Africa | Low |
| India, Chennai state (10/2004) | 60 | South-East Asia | Lower-middle |
| India, Haryana state (10/2004) | 60 | South-East Asia | Lower-middle |
| India, Karnataka state (11/2004) | 64 | South-East Asia | Lower-middle |
| India, Maharashtra state, 12 districts (10/2004) | 120 | South-East Asia | Lower-middle |
| India, Maharashtra state, 4 regions (01/2005) | 68 | South-East Asia | Lower-middle |
| India, Rajasthan state (04/2003) | 40 | South-East Asia | Lower-middle |
| India, West Bengal state (12/2004) | 61 | South-East Asia | Lower-middle |
| Indonesia (08/2004) | 73 | South-East Asia | Lower-middle |
| Islamic Republic of Iran (12/2007) | 60 | Eastern Mediterranean | Lower-middle |
| Jordan (05/2004) | 38 | Eastern Mediterranean | Lower-middle |
| Kazakhstan (11/2004) | 21 | European | Upper-middle |
| Kenya (11/2004) | 113 | Africa | Low |
| Kuwait (06/2004) | 50 | Eastern Mediterranean | High |
| Kyrgyzstan (02/2005) ^c | 30 | European | Low |
| Lebanon (02/2004) | 60 | Eastern Mediterranean | Upper-middle |
| Malaysia (10/2004) | 52 | Western Pacific | Upper-middle |
| Mali (03/2004) | 41 | Africa | Low |
| Mongolia (11/2004) | 29 | Western Pacific | Low |
| Morocco (04/2004) | 40 | Eastern Mediterranean | Lower-middle |
| Nigeria (09/2004) | 87 | Africa | Lower-middle |
| Oman (10/2007) | 62 | Eastern Mediterranean | High |
| Pakistan (07/2004) | 78 | Eastern Mediterranean | Lower-middle |
| Peru (09/2005) | 148 | Americas | Upper-middle |
| Philippines (02/2005) | 77 | Western Pacific | Lower-middle |
| São Tomé and Príncipe (05/2008) | 41 | Africa | Lower-middle |
| South Africa, Gauteng Province (11/2004) ^c | 30 | Africa | Upper-middle |
| Sudan, Gadarif State (02/2006) | 40 | Eastern Mediterranean | Lower-middle |
| Sudan, Khartoum state (06/2005) | 40 | Eastern Mediterranean | Lower-middle |
| Sudan, North Kordofan state (02/2006) | 29 | Eastern Mediterranean | Lower-middle |
| Sudan, Northern State (02/2006) | 36 | Eastern Mediterranean | Lower-middle |
| Syrian Arab Republic (12/2003) ^c | 57 | Eastern Mediterranean | Lower-middle |
| Tajikistan (02/2005) | 40 | European | Low |
| Thailand (10/2006) | 41 | South-East Asia | Lower-middle |
| Tunisia (03/2004) | 62 | Eastern Mediterranean | Lower-middle |
| Uganda (04/2004) | 40 | Africa | Low |
| Ukraine (09/2007) | 33 | European | Lower-middle |
| United Arab Emirates (12/2006) | 41 | Eastern Mediterranean | High |
| United Republic of Tanzania (09/2004) | 80 | Africa | Low |
| Uzbekistan (12/2004) ^c | 40 | European | Low |
| Yemen (07/2006) | 40 | Eastern Mediterranean | Low |
| Total facilities surveyed | 2779 | – | – |

WB, The World Bank; WHO, World Health Organization.

^a Public and private.

^b On 1 July 2009.

^c Did not survey public sector medicine outlets.

Table 2. Medicines included in secondary analysis of data in study comparing the availability of medicines for chronic and acute conditions in 40 developing countries

| Generic name | Therapeutic group ^a | No. of surveys (%) |
|--|---|--------------------|
| Medicines for acute conditions | | |
| Amoxicillin 250 or 500 mg capsule/tablet | Antibacterial | 50 (100) |
| Ciprofloxacin 250 or 500 mg capsule/tablet | Antibacterial | 50 (100) |
| Co-trimoxazole 8+40 mg/ml suspension | Antibacterial | 48 (96) |
| Ceftriaxone 1 g/vial injection | Antibacterial | 47 (94) |
| Diclofenac 25 or 50 mg capsule/tablet | Anti-inflammatory/antirheumatic | 47 (94) |
| Aciclovir 200 mg capsule/tablet | Antiviral | 44 (88) |
| Diazepam 5 or 10 mg capsule/tablet | Psycholeptic | 44 (88) |
| Fluconazole 50, 150 or 200 mg capsule/tablet | Antimycotic | 38 (76) |
| Metronidazole 200, 250, 400 or 500 mg capsule/tablet | Antibacterial | 29 (58) |
| Sulfadoxine+pyrimethamine 500+25 mg capsule/tablet | Antiprotozoal (antimalarial) | 27 (54) |
| Ibuprofen 200 or 400 mg capsule/tablet | Anti-inflammatory/antirheumatic | 24 (48) |
| Mebendazole 100 mg capsule/tablet | Anthelmintic | 19 (38) |
| Erythromycin 250 or 500 mg capsule/tablet | Antibacterial | 16 (32) |
| Albendazole 200 or 400 mg capsule/tablet | Anthelmintic | 15 (30) |
| Cephalexin 250 or 500 mg capsule/tablet | Antibacterial | 12 (24) |
| Medicines for chronic conditions | | |
| Glibenclamide 5 mg capsule/tablet | Drugs used in diabetes | 50 (100) |
| Salbutamol 0.1 mg inhaler | Drugs for obstructive airway disease | 50 (100) |
| Captopril 25 mg capsule/tablet | Agents acting on the renin-angiotensin system | 49 (98) |
| Atenolol 50 or 100 mg capsule/tablet | Beta-blocking agent | 48 (96) |
| Carbamazepine 200 mg capsule/tablet | Antiepileptic | 48 (96) |
| Omeprazole 20 mg capsule/tablet | Drugs for acid-related disorders | 47 (94) |
| Metformin 500 or 850 mg capsule/tablet | Drugs used in diabetes | 47 (94) |
| Ranitidine 150 mg capsule/tablet | Drugs for acid-related disorders | 47 (94) |
| Amitriptyline 25 mg capsule/tablet | Psychoanalgetic (antidepressant) | 45 (90) |
| Nifedipine Retard 20 or 30 mg tablet | Calcium channel blocker | 45 (90) |
| Fluoxetine 20 mg capsule/tablet | Psychoanalgetic (antidepressant) | 44 (88) |
| Hydrochlorothiazide 25 or 50 mg capsule/tablet | Diuretic | 43 (86) |
| Beclometasone 0.25 or 0.5 mg inhaler | Drugs for obstructive airway disease | 42 (84) |
| Phenytoin 100 mg capsule/tablet | Antiepileptic | 42 (84) |
| Losartan 25 or 50 mg capsule/tablet | Agents acting on the renin-angiotensin system | 36 (72) |

^a Anatomical Therapeutic Chemical (ATC) classification system, 2nd level.

Source: Reference ³².

Table 3. Mean availability of medicines used for acute and chronic conditions in 40 developing countries

| Sector and product type ^a | Mean availability ^b of medicines | | Difference in mean availability ^c (95% CI) | P |
|--------------------------------------|---|---------------------------------|---|----------------|
| | For acute conditions (95% CI) | For chronic conditions (95% CI) | | |
| Public sector | | | | |
| Generics (n=35) | 53.5 (46.23–60.8) | 36.0 (27.4–44.6) | 17.5 (6.5–28.6) | 0.001 |
| Originator brands (n=34) | 5.5 | 9.6 | -4.1 | — ^d |
| Any product type (n=35) | 55.9 (48.9–63.0) | 41.6 (32.1–51.2) | 14.3 (2.6–25.9) | 0.009 |
| Private sector | | | | |
| Generics (n=40) | 66.2 (60.4–72.1) | 54.7 (47.6–61.9) | 11.5 (2.4–20.6) | 0.007 |
| Originator brands (n=39) | 39.1 (31.0–47.3) | 39.1 (31.1–47.1) | 0.0 (-11.2–11.2) | 0.500 |
| Any product type (n=40) | 74.8 (70.2–79.4) | 69.2 (63.3–75.2) | 5.6 (-1.9–13.0) | 0.070 |

CI, confidence interval.

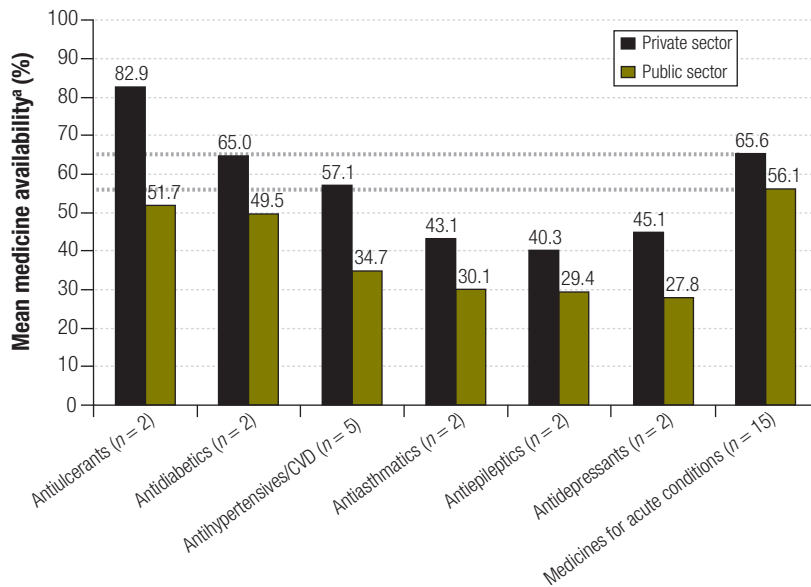
^a The number of countries included in the analysis varies because of differences in the products and sectors surveyed.

^b Availability is expressed as the percentage of facilities where a product was found on the day of data collection.

^c The values represent the mean availability of medicines for acute conditions minus the mean availability of medicines for chronic conditions.

^d The availability of originator brands in the public sector was 0% in several countries. This skewed the data and prevented the calculation of statistical significance.

Fig. 1. Comparison of mean availability of individual medicines for chronic conditions, by therapeutic class, and of 15 medicines for acute conditions, in 40 developing countries



CVD, cardiovascular disease.

^a Availability is expressed as the percentage of facilities where a product was found on the day of data collection.

When the availability of medicines for chronic conditions was disaggregated by therapeutic classes, in both the public and the private sector antiulcerants and antidiabetics were the drugs most widely available for the chronic indications studied, with availability comparable to that of the basket of medicines for acute indications (Fig. 1). In fact, in the private sector the average availability of antiulcerants was higher than that of the 15 medicines for acute conditions. Antihypertensives and cardiovascular medicines had the next highest availability among the drugs for chronic indications, but their availability was 8.5% and 21.4% lower than that of medicines for acute conditions in the private and the public sectors, respectively. Antiasthmatics, antiepileptics and antidepressants had similarly low availability (28–30% and 40–45% in the public and private sectors, respectively) and showed the largest difference in availability with respect to the acute conditions basket. The availability of individual medicines in the countries studied can be obtained from the corresponding author upon request.

Mean differences in the per cent availability of the baskets of medicines for acute and chronic conditions in each country are shown by World Bank income group (Fig. 2) and WHO region (Fig. 3). Fig. 2 shows an inverse relationship between income level and the gap in

availability between medicines for acute and chronic conditions, particularly in the public sector. In low- and lower-middle-income countries, the mean differences in availability were 33.9% and 12.9%, respectively, while in upper-middle-income countries the availability was nearly equal and in high-income countries medicines for chronic conditions had higher availability. In the private sector the availability gap was smaller than in the public sector in all country income groups. No relationship was found in the public or private sector between the gap in the availability of medicines for acute or chronic conditions and level of income disparity ($R^2 = 0.0283$ and 0.0118 , respectively)

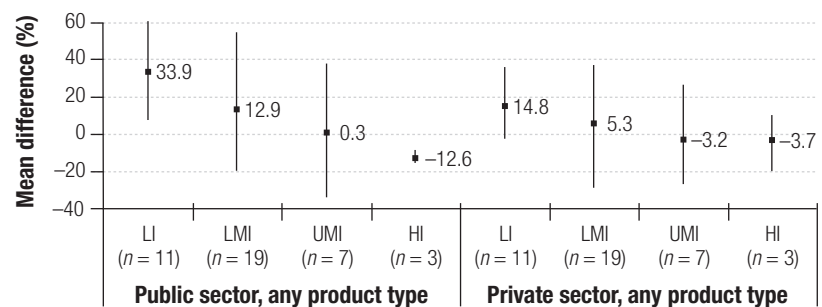
(data available from the corresponding author upon request).

The African region showed a substantially larger average difference (nearly 40%) than other regions in the availability of medicines for acute and chronic conditions in the public sector (Fig. 3). In the South-East Asia Region, the Region of the Americas and the Eastern Mediterranean Region, medicines for acute conditions were 4% to 14% more available in the public sector, on average, than those for chronic conditions, while in the European Region and the Western Pacific Region medicines for chronic conditions were somewhat more available than those for acute conditions in the public sector. In the private sector, the African region again showed the largest difference in availability between medicines for acute and for chronic conditions (16.7%), but this difference was less pronounced than in the public sector. In the Region of the Americas, the European Region and the South-East Asia Region, medicines for acute conditions were more available than those for chronic conditions in the private sector, while in the Eastern Mediterranean Region two medicine baskets had comparable availability and in the Western Pacific Region medicines for chronic conditions were more available than those for acute conditions.

Discussion

The WHO has set a benchmark of 80% for medicine availability,³³ against which the values found in this study were sub-optimal for both the acute and chronic condition medicine baskets, particularly in the public sector. Low public sector availability can result from factors such as

Fig. 2. Mean difference in the availability^a of medicines for acute and chronic conditions in 40 developing countries, by World Bank income group^b



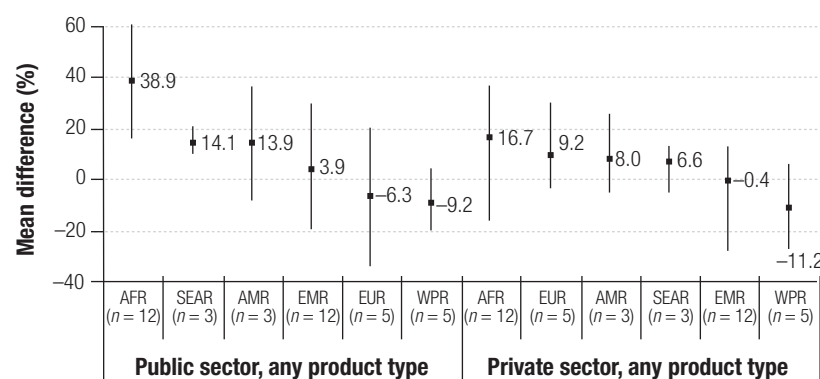
^a Availability is expressed as the percentage of facilities where a product was found on the day of data collection.

^b World Bank income groups: HI, high-income; UMI, upper-middle-income; LMI, lower-middle-income; LI, low-income.

inadequate funding, lack of incentives for maintaining stocks, inability to forecast needs accurately, inefficient purchasing/distribution systems or leakage of medicines for private resale.¹¹ The low availability of medicines in the public sector is a general problem, and this study shows that medicines for chronic conditions are even less available than medicines for acute conditions, particularly in low- and lower-middle-income countries. This may be the result of government policies that do not provide for widespread access to medicines for chronic conditions through the public sector, or it could stem from technical and resource-related factors hindering the adaptation of health systems to the changing epidemiological profile of their populations.

The difference in availability between the two medicine categories was consistently smaller in the private sector than in the public sector (11.5% versus 17.5%). This suggests that the current demand for medicines for chronic conditions exceeds what the public sector is providing and that low demand resulting from low diagnostic rates or other factors does not account for the low availability observed in the public sector. However, the availability of generics in the private sector was still low and probably not enough to compensate for the lack of availability in the public sector. Further, in the private sector, medicines for chronic conditions usually cost substantially more than in the public sector and are often unaffordable.^{11,19–25,34} Chronic disease patients, who need lifelong treatment, may find these medicines even less affordable than other patients. In developing countries, catastrophic health spending (e.g. spending on drugs and health care in excess of 40% of the income remaining after meeting subsistence needs) is common.³⁵ Health policies should therefore be designed to protect people from these expenditures by increasing financial risk protection through health insurance schemes that cover essential medicines for outpatients, including drugs for chronic conditions. The cost of medicines to both patients and health systems can also be reduced by promoting quality-assured, low-cost generic medicines through preferential registration procedures, financial incentives for prescribing and dispensing generics, generic substitution and measures to heighten trust among physicians, pharmacists and patients in the quality of generics.¹¹

Fig. 3. Mean difference in the availability^a of medicines for acute and chronic conditions in 40 developing countries, by World Health Organization region^b



^a Availability is expressed as the percentage of facilities where a product was found on the day of data collection.

^b World Health Organization regions: AFR, Africa; AMR, Americas; EMR, Eastern Mediterranean; EUR, European; SEAR, South-East Asia; WPR, Western Pacific.

In both the public and private sectors, antiasthmatics, antiepileptics and antidepressants, and antihypertensives to a lesser extent, were the drivers of the gaps in the availability of drugs in the acute and chronic condition baskets (Fig. 1). However, as previously reported,¹⁹ in some therapeutic classes (e.g. antidiabetics and antihypertensives) substantial variation was observed in the availability of individual medicines. Results may also have been influenced by the treatment options included in each class. For example, the availability of antidiabetics may have been influenced by the exclusion of insulin, whose availability was low in a previous study.²³ The reliability of our findings is supported by the fact that the therapeutic classes with the highest to lowest availability followed the same pattern in both the public and private sectors.

As the income level of a country decreases, the difference in availability between medicines for acute and chronic conditions increases, particularly in the public sector (Fig. 2). Priority should therefore be given to improving the availability of medicines for chronic conditions in low- and lower-middle-income countries, where the availability gaps are largest. According to a similar analysis by WHO region, the availability of the two treatment types differs most widely in countries in the African Region (Fig. 3). Since 25% of all deaths in Africa are caused by chronic conditions, current disease patterns do not explain the observed gap. Disease patterns vary by individual country, but the medicines in this study are used to treat very common chronic conditions and should be available in sufficient quantities in any health system.

This analysis improves upon a previous analysis of medicine availability based on data from WHO/HAI surveys¹¹ in that alternate strengths of the same medicine were combined to account for country-level differences in medicine use. However, availability data only apply to the day of data collection and may not reflect average availability over time. Nevertheless, the data were collected in at least 20 facilities per country using a validated sampling frame²⁸ and therefore provide a reasonable estimate of the overall situation. Further, the analysis is more concerned with the relative availability of medicines used for acute and chronic conditions than with their absolute availability. Another limitation is that the availability of individual medicines in the public sector may be influenced by whether or not they are on the national essential medicines list (a government-approved selective list used for procurement or reimbursement) and by the level(s) of care for which they are expected to be available.

The choice of medicines for the secondary analysis, which was restricted to the medicines included in WHO/HAI surveys, may also have limited the results. These surveys comprise both common medicine formulations that enable international comparisons and medicines of national importance, which are selected in accordance with disease burden, medicine usage patterns and recommendations in standard treatment guidelines. The selection process for survey medicines is described in detail elsewhere.^{26,27} However, country variations in medicine use may limit the comparability of results.

Prior to 2008, when all but two of the surveys were conducted, the WHO/HAI recommended a global list of 30 medicines for inclusion in all surveys, plus 20 medicines selected nationally.²⁶ Among the medicines most frequently surveyed and as such included in the analysis, all 15 of the drugs used to treat chronic conditions were on the global list, versus only 9 (60%) of the drugs used to treat acute conditions. More local adaptations were therefore made for the latter than for the former, perhaps because treatment alternatives for chronic conditions were fewer and the use of these drugs consequently more consistent across countries. In developing the second edition of the WHO/HAI survey manual, Intercontinental Marketing Services Health (IMS Health) consumption data were used to analyse the medicines surveyed and those recommended for chronic conditions were found to be widely used worldwide.²⁷ However, a further limitation is that the lack of a clear distinction between acute and chronic indications for some medicines that are used intermittently over long time periods (e.g. antimalarials) and for medicines used to treat acute episodes of chronic disease (e.g. diazepam). In addition, while all of the medicines studied are off patent, the date of patent expiry may have affected the availability of multi-source generic products on the market. Certain products, such as omeprazole, losartan, ciprofloxacin and fluconazole, have been off patent for less than 10 years and the persistence of the originator brand product following patent expiry may have reduced the availability of generics of these products.

Despite these limitations, this study raises important concerns about access to treatment for the millions of people with chronic conditions who live in developing countries. Governments should prioritize the supply of medicines for chronic conditions through their public health systems to ensure that people have access to the treatment they need. Low availability in the public sector can be through improved procurement efficiency and supply chain management as well as adequate, equitable and sustainable financing. In practice this could mean implementing schemes to make medicines for chronic

conditions available through the private sector at no cost or at subsidized prices, as is done in Jamaica and in Trinidad and Tobago^{36,37}. International financing can also strongly affect public sector availability. In Kenya, for example, the availability of the antimalarial combination composed of artemether-lumefantrine increased from 4% to 91% the year following a grant from the Global Fund to Fight AIDS, Tuberculosis and Malaria.¹⁶ While this study addresses the supply-side barriers to access to treatment for chronic conditions, efforts to address demand-side issues are also required. Supply that remains on the shelf is of little use; conversely, stimulating demand makes no sense if there is no supply. The extent to which a low demand for medicines for chronic conditions affects their availability is outside the scope of this analysis and warrants further investigation. However, our analysis suggests that current demand outweighs supply in the public sector and that no efforts should be made to further increase demand unless an adequate and ongoing supply of medicines can be ensured.

Successes in scaling-up treatment for HIV infection can offer lessons in connection with other chronic conditions. For example, HIV/AIDS treatment programmes in sub-Saharan Africa have shown relatively high patient adherence (77%) to complex antiretroviral regimens.³⁸ Ensuring sustained medicine availability is clearly an essential precondition to achieving high adherence rates. Success in the field of HIV/AIDS stems largely from global and national efforts in the areas of mobilization and advocacy, financing and engagement of civil society.³⁹ Alongside current efforts in connection with communicable diseases, international agencies, governments and other stakeholders should work together to raise the profile of chronic diseases on health and development agendas and to advocate for a balanced approach that addresses both prevention and treatment.

To date, the control of chronic diseases in developing countries has received little international attention.^{3,40} The UN Summit on Non-communicable Diseases to be held in September 2011 is a positive step towards recognizing the importance of chronic diseases on the global health

agenda. Our study shows that reorienting and strengthening health systems to enable a more effective and equitable response to chronic diseases should be a key priority, as recommended in the WHO Action Plan for the Global Strategy for the Prevention and Control of Chronic Diseases. Target 8.E of the Millennium Development Goals deals with access to affordable essential medicines in developing countries.^{10,12,16} To achieve this target, special efforts will be required to ensure universal and sustained availability of medicines for chronic conditions.

Conclusion

Although the disease burden from chronic conditions in developing countries is large, wide gaps exist in the availability of medicines for chronic conditions. This study shows that such medicines are less available than those for acute conditions, which have traditionally been the focus of health systems in these countries. To ensure equitable access to treatment for different types of diseases, greater national and international attention should be given to chronic disease control, including access to medicines. ■

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ملخص

الاختلافات في توفّر أدوية الحالات المزمنة والحادة في القطاعين العام والخاص في البلدان النامية

ومضادات الصرع، ومضادات الاكتئاب، ثم يليها خافضات ضغط الدم، هي السبب في الاختلافات الظاهرة. وقد لوحظ ارتباط عكسي بين مستوى دخل البلد وفجوة توفّر الأدوية في كلا المجموعتين، ولاسيما في القطاع العام. ففي البلاد المنخفضة الدخل والبلاد الأشد انخفاضاً للدخل كان توفّر أدوية الحالات الحادة 33.9% و 12.9% بالترتيب، وكانت تلك الأدوية أكثر توفّراً من أدوية الحالات المزمنة في القطاع العام. وكانت اختلافات توفّر الأدوية أقل في القطاع الخاص عنها في القطاع العام في جميع فئات دخل البلدان. الاستنتاج لا تشرح أنماط المرض الحالية الفجوات الهائلة الملحوظة في توفّر أدوية الحالات المزمنة والحالات الحادة. وهناك حاجة لتدابير تسعى لتحقيق استجابة أفضل للمرحلة الوبائية الانتقالية نحو الأمراض المزمنة في البلدان النامية بجانب الجهود المبذولة فيها حالياً للارتقاء بعلاج الأمراض السارية.

الغرض تقيّم الاختلافات المحتملة في توفّر أدوية الحالات المزمنة والحالات الحادة في البلدان المنخفضة والمتوسطة الدخل.

الطريقة جُمعت المعطيات حول توفّر 30 دواء شائعاً 15- دواء لحالات حادة، و15 دواء لحالات مزمنة- من مسوحات تركزت على المرافق أجريت في 40 بلداً نامياً. وجمعت النتائج بحسب تصنيف البنك الدولي لدخل البلدان وبحسب أقاليم منظمة الصحة العالمية.

النتائج كان توفّر أدوية الحالات الحادة والحالات المزمنة دون المستوى في البلدان، ولاسيما في القطاع العام. وكانت الأدوية غير المحدودة الملكية للحالات المزمنة أقل توفّراً بكثير عن مثيلاتها للحالات الحادة في كل من القطاع العام (حيث توفّر 36.0% لقاء 53.5%؛ قوة الاحتمال = 0.001) وفي القطاع الخاص (54.7% لقاء 66.2%؛ قوة الاحتمال = 0.007). وكانت مضادات الهيستامين،

الخلاصة

تفاوت في إمكانية الحصول على الأدوية الحادة والمزمنة في القطاعين العام والخاص في البلدان النامية

الهدف في هذا البحث في إمكانية الحصول على الأدوية الحادة والمزمنة في القطاعين العام والخاص في البلدان النامية.

الطريقة تم جمع البيانات حول توفر 30 دواء شائعاً 15- دواء لحالات حادة، و15 دواء لحالات مزمنة- من مسوحات تركزت على المرافق أجريت في 40 بلداً نامياً. وجمعت النتائج بحسب تصنيف البنك الدولي لدخل البلدان وبحسب أقاليم منظمة الصحة العالمية.

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التي هي عوامل رئيسية في الربو، وبتحليلات إضافية، فإنها كانت متاحة في القطاع العام والخاص في البلدان النامية. وكانت الأدوية غير المحدودة الملكية للحالات المزمنة أقل توفّراً بكثير عن مثيلاتها للحالات الحادة في كل من القطاع العام (حيث توفر 33.9% لقاء 53.5%؛ P = 0.001) وفي القطاع الخاص (54.7% لقاء 66.2%؛ P = 0.007). وكانت مضادات الهيستامين،

النتائج في هذا البحث في إمكانية الحصول على الأدوية الحادة والمزمنة في القطاعين العام والخاص في البلدان النامية. وهناك حاجة لتدابير تسعى لتحقيق استجابة أفضل للمرحلة الوبائية الانتقالية نحو الأمراض المزمنة في البلدان النامية بجانب الجهود المبذولة فيها حالياً للارتقاء بعلاج الأمراض السارية.

Résumé

Différences de disponibilité des médicaments indiqués dans les pathologies chroniques et aiguës dans les secteurs public et privé des pays en voie de développement

Objectif Rechercher les différences potentielles de disponibilité des médicaments préconisés dans le traitement des maladies chroniques et aiguës dans les pays à revenu faible et à revenu moyen.

Méthodes Des données relatives à la disponibilité de 30 médicaments faisant l'objet d'études régulières – 15 pour les pathologies graves et 15 pour les pathologies chroniques – ont été obtenues à partir d'enquêtes menées dans les centres de soins de 40 pays en voie de développement. Les résultats ont été rassemblés par groupe de revenu national, selon la Banque mondiale, et par région, selon l'Organisation mondiale de la Santé.

Résultats La disponibilité des médicaments préconisés pour les maladies aiguës et pour les maladies chroniques était sous-optimale dans ces pays, notamment dans le secteur public. Les médicaments génériques des maladies chroniques étaient significativement moins disponibles que les médicaments génériques des maladies graves et ce, à la fois dans le secteur public (36,0% de disponibilité contre 53,5% ; P = 0,001) et dans le secteur privé (54,7% contre 66,2% ; P = 0,007). Les antiasthmatiques, antiépileptiques et antidépresseurs, suivis des antihypertenseurs,

arrivaient en tête des différences observées. Une association inverse a été constatée entre le niveau de revenu national et l'écart de disponibilité entre les deux groupes de médicaments, en particulier dans le secteur public. Dans les pays à revenu faible et à revenu moyen inférieur, les médicaments des pathologies aiguës étaient respectivement 33,9% et 12,9% plus disponibles dans le secteur public que les médicaments des pathologies chroniques. Les différences de disponibilité dans le secteur privé étaient inférieures à celles du secteur public et ce, dans tous les groupes de revenu national.

Conclusion Les structures de morbidité actuelles n'expliquent pas les écarts significatifs observés en termes de disponibilité des médicaments utilisés dans les pathologies chroniques et graves. Il convient d'adopter des mesures permettant de mieux répondre à la transition épidémiologique vers les maladies chroniques dans les pays en voie de développement et concomitantes aux efforts actuels de généralisation du traitement des maladies transmissibles.

Резюме

Различия в доступности лекарственных средств против хронических и острых состояний в государственном и частном секторах здравоохранения развивающихся стран

Цель Исследовать потенциальные различия в доступности лекарственных средств против хронических и острых состояний в странах с низким и средним доходом.

Методы Данные о доступности 30 часто спрашиваемых лекарств – 15 против острых и 15 против хронических состояний – были получены в ходе опросов, проводившихся в медицинских учреждениях в 40 развивающихся странах. Результаты были обобщены с разбивкой по группам стран с различными уровнями дохода по классификации Всемирного банка, а также по регионам Всемирной организации здравоохранения.

Результаты Доступность лекарственных средств, как против острых, так и против хронических состояний в различных странах была неудовлетворительной, особенно в государственном секторе. Лекарства-дженерики против хронических состояний были значительно менее доступны, чем лекарства-дженерики против острых состояний, как в государственном (доступность, соответственно, 36,0 и 53,5%; $P=0,001$) так и в частном секторе (54,7 и 66,2%, соответственно; $P=0,007$). В качестве основных «рычагов» наблюдаемых различий выступали противоастматические,

противоэпилептические средства, антидепрессанты и лекарственные средства против гипертензии. Была выявлена обратно пропорциональная зависимость между уровнем дохода страны и разрывом в доступности по обеим группам лекарственных средств, особенно в государственном секторе. В странах с низким доходом и доходом ниже среднего доступность лекарственных средств против острых состояний была, соответственно, на 33,9 и 12,9% выше, чем доступность лекарственных средств против хронических состояний. Во всех группах стран по уровню дохода различия в доступности лекарств были менее значительными в частном секторе, чем в государственном. **Вывод** Наблюдаемые в настоящее время модели развития заболеваний не объясняют серьезных разрывов в доступности лекарственных средств против хронических и острых состояний. Наряду с продолжающимися усилиями по расширению масштабов лечения инфекционных болезней необходимы мероприятия, позволяющие более эффективно реагировать на эпидемиологический переход к хроническим состояниям в развивающихся странах.

Resumen

Diferencias en la disponibilidad de los medicamentos para enfermedades crónicas y agudas en los sectores público y privado de los países en vías de desarrollo

Objetivo Investigar las posibles diferencias de disponibilidad de los medicamentos para enfermedades crónicas y agudas en países de ingresos bajos y medios.

Métodos A través de encuestas realizadas en instalaciones de 40 países en vías de desarrollo se obtuvieron los datos sobre la disponibilidad de 30 medicamentos que suelen someterse a estudio (15 para enfermedades agudas y otros 15 para enfermedades crónicas). Los resultados se agregaron por grupo de ingresos según el Banco Mundial y por las regiones de la Organización Mundial de la Salud.

Resultados La disponibilidad de los medicamentos para enfermedades agudas y enfermedades crónicas se situó por debajo del nivel óptimo en todos los países analizados, especialmente en el sector público. La disponibilidad de medicamentos genéricos para enfermedades crónicas fue significativamente inferior a la de los medicamentos genéricos para enfermedades agudas, tanto en el sector público (disponibilidad de un 36,0% frente a un 53,5%; $p=0,001$) como en el sector privado (54,7% frente al 66,2% $p=0,007$). Los impulsores de las diferencias observadas

fueron los medicamentos para el tratamiento del asma, la epilepsia, la depresión y la hipertensión. Se observó una relación inversa entre el nivel de ingresos del país y el problema de disponibilidad para ambos grupos de medicamentos, especialmente en el sector público. En los países de ingresos bajos y medio-bajos, la disponibilidad de medicamentos para enfermedades agudas fue, respectivamente, un 33,9% y un 12,9% más alta en el sector público que la de los medicamentos para las enfermedades crónicas. En todos los grupos por ingresos, las diferencias de disponibilidad fueron menores en el sector privado que en el sector público.

Conclusión Los patrones actuales de enfermedades no explican las marcadas diferencias que se han observado en la disponibilidad de medicamentos para enfermedades crónicas y agudas. Es necesario tomar medidas para responder mejor a la transición epidemiológica de los países en vías de desarrollo, respecto a las enfermedades crónicas, y unir las a los esfuerzos actuales para aumentar gradualmente el tratamiento de las enfermedades transmisibles.

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