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TRADE BARRIERS AND PRICES OF ESSENTIAL HEALTH-SECTOR INPUTS

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Foreword

This paper is part of a series of research papers prepared for the Working Group on Health and International Economy of the Commission on Macroeconomics and Health (CMH). The Commission was set up in January, 2000, by the Director General, World Health Organisation, under the Chairmanship of Prof. Jeffrey Sachs. As a member of the CMH and Co-chairperson of this Working Group, I have had the privilege of commissioning research papers on issues of importance for health and the international economy.

This paper investigates the role of trade barriers on the prices of inputs, both pharmaceutical and non-pharmaceutical, required for health interventions. The analysis of a non-pharmaceutical input called Insecticide Treated Bednets (ITNs) as a preventive intervention of malaria, suggests that reduction of tariffs in this category could increase usage by not more than 3% in Sub-Saharan Africa and even less elsewhere. The findings on pharmaceutical prices suggest that trade barriers are of secondary importance in affecting or determining drug prices. Domestic factors, such as distribution costs and retail mark-ups, and international factors such as the new patent regime, have a much greater impact on drug prices. These issues are highly controversial. I hope that this paper contributes to improve the quality of debate.

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I Introduction

While health is determined by a broad range of factors, health sector interventions for prevention and treatment can make a major contribution to health improvements. However, delivery of these interventions requires access to inputs; and the prices of inputs relative to the resources available to pay for them are a key constraint to access in many developing countries. This applies both to publicly provided services and private purchases of inputs. Where inputs are unaffordable, this reduces the overall uptake of interventions. It also has important implications for equity, as interventions will effectively be rationed to those with the resources to pay for them.

Input prices are therefore a key issue, both for health and for equity in health; and policy changes directed at reducing these prices have the potential to improve both. The enormous scale of price differences between countries, most notably for pharmaceuticals (Bala and Sagoo, 2000), but also to a lesser extent for non-pharmaceutical products such as bednets for protection against malaria (Simon et al, 2001, Table 3), suggest that the potential impact of such changes is considerable.

One of the determinants of prices for internationally tradeable goods is import tariffs and other trade barriers[1]. Other things being equal, such trade barriers increase prices. Tariffs increase the prices of imported inputs directly, by levying a tax on them, while non-tariff barriers create an artificial scarcity, driving up prices in the domestic market. In both cases, the resulting increase in import costs allows domestic producers

[1] Assessment of the effects of non-tariff barriers requires the estimation of tariff equivalents, which is beyond the scope of this paper. The discussion and analysis are therefore limited to tariff barriers.

also to charge higher prices for their own output. In principle, lowering these barriers should allow prices to be reduced, and both access and equity to be increased.

Clearly, there are costs associated with the lowering of trade barriers. In particular, the reduced protection worsens the financial position of domestic producers, potentially causing losses of employment and income; and lower receipts from tariffs reduce overall government revenues. In general, it is assumed that these costs are off-set by the increased economic efficiency and consumer welfare associated with freer trade, although this introduces trade-offs which need to be taken into account.

The case of pharmaceuticals, however, may be rather different from the assumptions underlying the conventional view of the effects of trade liberalisation. Specifically,

- border prices vary very considerably between countries as a result of price discrimination by suppliers, who are given a degree of effective monopoly over patented products by the international intellectual property régime;

- the degree of monopoly in the domestic market are significantly affected by the presence of a domestic pharmaceutical industry producing or with the potential to produce generic substitutes; and

- the viability of the domestic pharmaceutical industry may be significantly affected by the scale and scope of protection against pharmaceutical imports.

The purpose of this paper is therefore to investigate the effects of trade barriers to inputs required for health interventions. It begins with a general discussion of price determination, and the role of trade barriers and other factors in this process. The effects of trade barriers to non-pharmaceutical inputs are then discussed, with reference to the case of insecticide treated bednets (ITNs) as a preventive intervention of malaria, based on a recent study for Roll Back Malaria (Simon et al, 2001). This is followed by an analysis of the relationship between trade barriers to pharmaceutical products in a sample of developing countries and pharmaceutical prices in those countries, using data from the WTO (as reproduced in Bale, 2001), and a 1999 price survey conducted jointly by Health Action International and Consumers International (Bala and Sagoo, 2000). The paper concludes by discussing potential non-price effects of lowering trade barriers (and indirect price effects through the availability of locally produced generic substitutes), and assessing the trade-offs involved.

II Price Determinants: General Considerations

Variations in the prices of internationally traded goods may be divided broadly into three components:

(a) differences in border prices;

(b) price differences arising from inter-country differences in import tariffs and non-tariff barriers; and

(c) differences in in-country costs, including internal transport and delivery costs, wholesaling and retailing mark-ups, domestic taxation, etc.

Contrary to the standard economic assumption, **border prices** for many pharmaceuticals vary very considerably between countries. This applies primarily – but by no means exclusively – to those which are under patent protection, as this effectively confers monopoly rights on producers where patents are effectively protected, allowing price discrimination. Since world market prices are often many times production costs, these price differences can be very considerable. There may also be price discrimination between sectors within countries, eg to charge lower prices to the public and/or non-profit sectors than for the private-for-profit sector. It should be noted, however, that income per capita is only one factor affecting the prices charged to different countries, eg according to market structures and conditions. As a result, while border prices are higher *on average* for rich countries than for poor countries, prices to some poorer countries are higher than for some better-off countries.

The potential scale of these price differences is demonstrated by the recent developments on the international pricing of anti-retrovirals. Anti-retroviral drugs which are sold on the US market for a price equivalent to $10,000 per patient per year are now available from the same producers for $600 per patient per year, and from generic producers for $250 per patient per year, to public and non-profit health service providers in some developing countries. These lower prices are still sufficient to cover production costs. It should be noted, however, that the lower prices do not in general apply to the private-for-profit sector. Thus the wholesale price, excluding VAT, of these drugs in South Africa (one of the countries eligible for the lower prices) is equivalent to $3,431 per patient per year[2].

While border prices are generally assumed to be exogenous in assessments of trade policy, the normal assumption is that the (direct) price effects of **tariffs** are equivalent to the amount of the tariff on a particular product.

According to a recent paper commissioned by the WTO,

> "Average tariffs on final pharmaceutical products are generally low or moderate in the developing world with the exception of two countries, India and Tunisia, where they are 30 and 20.6 per cent respectively. For active ingredients that go into the manufacture of pharmaceuticals, six developing countries have average tariff s in the range of 20 to 30 per cent, *viz*. Burkina Faso, Pakistan, Tanzania, India, Kenya and Tunisia."

(Watal, 2001, p5)

Besides the countries cited above, the WTO data provided in the Annex to Bale (2001) show tariffs in excess of 13% for only two countries in the case of final

[2] Based on prices in electronic communication from Jamie Love (CPTech), 23 April (ddI $1.78 per day; d4T $4.27 per day; Combivir $4.66 per day) adjusted for 14% VAT.

products (Nigeria and Mauritius at 17.1% and 16% respectively), and for only three countries on active ingredients (Algeria and Ethiopia at 15% and Rwanda at 13.3%).

The effect of tariffs on health-related inputs is much more complex in practice than it first appears, as they are typically subject to a range of exemptions, waivers, reductions and partial reliefs, which vary considerably between countries, between products, and between sectors (public, private-for-profit and non-profit) within countries. In some cases they may be discretionary, and therefore apply unequally even for different distributors of the same product in the same sector in the same country.

A survey of tax treatment of public health commodities in 22 developing countries (Krasovec and Connor, 1998) found that purchases of contraceptives, vaccines and oral rehydration salts were exempt from import taxes or subject to waivers for public sector buyers in 69-77% of countries, for private non-profit buyers in 42-57% of countries, and for private-for-profit buyers in 28-43% of countries. Partial reliefs or reductions were available in up to a further 20% of countries.

Failure to take account of these details of tariff application and implementation, and other factors such as the take-up rate of waivers, may seriously distort the results of any analysis. However, it is not possible to take account of the effects of these factors, as the data available are very limited. There is no international source; and collecting data at the national level is both difficult and resource-intensive. The USAID-financed study cited above, for example, sought data from 44 countries, but received responses from only half of these, and complete data from fewer than one-quarter. Moreover, this study covers only a range of non-pharmaceutical products in a relatively small group of countries; and it does not include other data relevant to analysis, eg on the take-up rates for discretionary waivers and the extent of tax reductions and partial reliefs. Even these limited data are not available for pharmaceuticals.

The most that can be said, therefore, is that these factors will tend to weaken any correlation which might exist between tariff barriers and domestic product prices; that tariff levels will overstate the overall extent of protection in most developing countries (although this may be off-set by non-tariff barriers where these are not taken into account); and that this effect is likely to be greatest for publicly provided health services, and least for private-for-profit suppliers.

Additional price variations arise from differences in **local costs and mark-ups**. These include, in particular, consumption, turnover and value-added taxes; storage, transport and distribution costs; and mark-ups at the wholesale and retail levels. These are also likely to vary considerably between countries, according to, for example, geographical distances and transport infrastructure, the efficiency of transportation and distribution systems, wage rates, competitive conditions at the wholesale and retail levels, etc. These factors are also likely to vary significantly between regions within countries, most notably between urban and rural areas.

It is difficult to assess or generalise about the scale of local costs. However, according to WHO (2001), "import duties, taxes, wholesale and retail mark-ups, both formal and informal, can double the price of a drug between manufacturer and consumer". IFPMA (2000) found wholesale and retail mark-ups up to 150-200% in some developing countries, although in other cases (eg India) retail margins may be as low as 25% (Watal, 2000). Distribution margins and taxes in OECD countries are "often in the order of 40 per cent" (Watal 2001). This suggests that *variations* in local costs may result in prices being roughly doubled in the highest-cost countries relative to the lowest.

It should be noted that all of these costs interact. This applies most clearly to domestic taxes which represent a fixed percentage of the consumer price of a product. Similarly, *ad valorem* tariffs are charged as a fixed percentage of border prices; and wholesale and retail margins, though not so formally determined, are typically charged as a percentage of the cost to the supplier. Since most of the costs identified above are determined broadly in this way, the effect of a change in any price determinant can be expected to be broadly in line with the proportional rather than the absolute effect on the price at the point at which it applies. (So, for example, a reduction in the tariff rate of 1 percentage point can be expected to result in a reduction in the final product price in the order of 1%, because it will reduce retail and wholesale mark-ups by around 1%, as well as increasing the amount paid in tariffs by 1% of the border price.) However, it should be noted that this is an approximation (eg for transportation and storage) will not be affected.

III Non-Pharmaceuticals: the Case of Impregnated Bednets

Simon et al (2001) provide an assessment of tariffs and domestic taxes on treated and untreated bednets and insecticides in Sub-Saharan Africa. The use of insecticide-treated bednets (ITNs) is an important preventive measure against malaria, which is generally regarded as cost-effective. This study provides a basis for an illustrative assessment of the potential of lowering tariff barriers for increasing access to non-pharmaceutical inputs required for health interventions.

Tariff rates on untreated nets and netting materials were found to be typically between about 20% and 30% in the 29 countries where they were assessed. Below this range, tariffs were zero in Côte d'Ivoire, Tanzania and Uganda, and 5-10% in Nigeria and Ethiopia; above, they were 42% in Senegal and 40-60% in Rwanda[3]. Tariffs on insecticides were more polarised. Five countries were found to have zero tariffs, eight to have rates of 5%, and four rates of 10-15%. Six of the eight countries with rates in excess of 15% had rates between 25% and 30%, and two between 30% and 35%.[4]

The initial (capital) cost of an impregnated bednet is made up of the cost of the netting, the cost of the insecticides used and local costs in production (eg turning netting into nets), transportation, retailing, domestic taxation, etc. The illustrative figures for

[3] Four other countries also have more than one rate, and in all cases part of the range falls above and/or below the 20-30% span. These are Liberia (2.5-25%), DR Congo (5-30%), Burundi (17-40%), and Gambia (4-60%).

[4] Again, four countries had multiple rates, all but one spanning from the lower range to the higher range: DR Congo (5-30%), Congo-Kinshasa (5-30%), Uganda (10-30%) and Gabon (5-20%). It should be noted that one of the two countries with rates in excess of 30% was Mozambique (where the figure given was for 1993).

Nigeria in Table 11 of Simon et al (2001) suggest that the net and the insecticide each represents around half of the total cost.

Based on these figures, and the estimates of the simulations of price effects of tax and tariff reductions in the same table, the price effects of eliminating tariffs on nets and insecticides might be in the order of 15-20% in those countries with high tariffs on both (around one-quarter of those for which data are provided); 10-15% in countries with high tariffs on nets, but low tariffs on insecticides (around half the sample); and 0-10% in those countries with low or zero tariffs on both (about a quarter of the sample. The cost of subsequent retreatment might also be reduced by 15-20% in countries with high insecticide tariffs, and up to 10% for those with low tariffs.

The potential effects of these price changes on utilisation are impossible to assess with any reliability, because "almost nothing is known about price elasticities of demand for malaria prevention or ITNs" (Simon et al, 2001, p21). The two studies they cite, from Tigray in Ethiopia and the Gambia, suggest figures in the order of 0.5 and 0.75 respectively. This would suggest that the elimination of tariffs on insecticides and bednets might increase utilisation by up to around 15%, and by around 5-10% in a typical Sub-Saharan country. (It should be noted, however, that this may in part represent a switch of expenditure away from other preventive measures such as coils and sprays, suggesting a smaller effect on overall protection.)

The current levels of utilisation vary very widely not only between countries, but also within them (Simon et al, 2000, Table 4). Studies of different areas of rural Ghana, for example, show rates of 4% and 93%. However, an indication of overall utilisation rates is provided by recent (2000) national surveys of Nigeria (10%) and Tanzania (16%), and by surveys by Baume C/NetMark of five provinces in each of Mozambique, Nigeria, Senegal and Zambia, which suggest figures of 26%, 12-14%, 25-34% and 25-27% respectively, depending whether the unweighted mean or the median is used in each case.

If these rates are representative of the wider picture, this suggests that current utilisation rates may be typically in the order of 10-30%. Assuming an increase in utilisation of 5-10% as a result of tariff elimination, as estimated above, this would suggest an increase in the overall rate of utilisation of between about ½% and 3% of the population.

The relatively low initial rate of utilisation also has important implications for the distributional effects of lowering tariff barriers. Assuming that utilisation varies broadly in line with income (ie that those with the highest incomes are the first to use ITNs, and that the effect of lowering their cost is to extend utilisation further down the income distribution), this suggests that the income of the marginal user will be well above the "one-dollar-per-day" international poverty line in Zambia, around double this level in Mozambique, Nigeria and Senegal, and significantly higher in Tanzania (based on poverty incidence data from World Bank, 2001, Table 2.6).

This suggests that eliminating tariffs on bednets and insecticides could have a small but significant effect on ITN utilisation, at least in Sub-Saharan Africa. However, four important caveats need to be borne in mind.

First, *prices are only one factor affecting utilisation*. Others include, for example, comfort and convenience, perceived risks from exposure (particularly of children) to insecticides, and insufficient information about the potential health benefits. Resolving these issues may increase demand for ITNs considerably. Simon et al cite an ITN project in Southern Mozambique, for example, which resulted in 54% of the population purchasing bednets for $5, when only 3% had expressed a willingness to pay that amount prior to the project. It would therefore be appropriate to consider the relative effects on utilisation of tariff reduction and of allocating the revenues raised to education on the benefits of ITN use.

Second, *tariffs are only one factor determining prices* of ITNs. For untreated nets, as shown in Table 1, the effect of domestic taxes is of a similar order of magnitude; and other effects (variations in border prices and local costs) are typically between about 2 and 5 times as great[5].

Finally, it should also be emphasised that the potential effects of tariff reductions in other regions affected by malaria are likely to be considerably smaller than in Sub-Saharan Africa, which has much higher tariff rates than other developing regions; and that revenues are a particularly important source of government revenue in many Sub-Saharan countries.

IV Tariff Rates and Pharmaceutical Prices

This Section seeks to assess the relationship between consumer prices for pharmaceutical products in developing countries and tariff rates on final pharmaceutical products and on active ingredients required for their production. The analysis is based on data from two sources:

(a) a survey by Consumers International and Health Action International of 16 drugs in 36 countries (11 developed and 25 developing) in July/August 1999 (Bala and Sagoo, 2000); and

(b) WTO data on the highest and lowest tariff rates on medicaments and active ingredients in developing countries, as reproduced in Bale (2001), Annex 2[6].

The countries included in the analysis are Burkina Faso, Cameroon, Malawi, Mozambique, Nigeria, South Africa, Tanzania, Uganda, Zambia, India, Indonesia, Malaysia, Pakistan, Argentina, Brazil, Bolivia, Nicaragua and Peru.

[5] This is based on lowering the price net of taxes and tariffs to the lowest for the countries for which recent data are available (Kenya, at $3.04). It should be noted that this systematically under-estimates the potential for other price effects, as the net price for Kenya includes excise tax, the rate of which is not specified.

[6] India, cited by Watal's (2001) paper for WTO as having the highest tariff rate on final products of 30%, but not included in the Bale (2000) list of high tariffs on final products is included in this category as well as a country with high tariffs on active ingredients.

The pharmaceuticals were selected by Bala and Sagoo from the 73 top-selling products, as products which are on the WHO list of essential drugs, or which are included on a number of developing country essential drugs lists, or widely used in developing countries in the management of people living with HIV/AIDS, plus the two top-selling pharmaceuticals worldwide. The products are Ceftriaxone Sodium, Indinavir, Lamivudine, Simvastatine, Zidovudine, Ciprofloxacin, Fluconazole, Omeprazole, Acyclovir, Atenolol, Captopril, Diclofenac, Diltiazem, Metformin, Nifedipine and Ranitidine.

The data provided by Bala and Sagoo show very wide ranges of final prices for these products between countries, the ratios between the highest and lowest prices ranging from 4:1 to 59:1.

Because Bala and Sagoo's data for some products are for different strengths in different countries, they are consolidated for the purpose of this analysis, to provide a more adequate sample size. Therefore the figure used for each combination of product and country is the cheapest available means of purchasing the largest dose cited. For each product the average prices are compared for countries included in Bale's list of high-tariff countries and low-tariff countries for each of medicaments and active ingredients. Because the very wide range of prices for some products means that arithmetic means may distort the results, both the arithmetic and geometric means are considered.

These two sets of data are compared, for each of the products, in Annex I, and the results are summarised in Tables 2 and 3.

As shown in Table 2, the majority of drugs are cheaper in countries with higher tariffs on final products and, irrespective of whether the arithmetic or the geometric mean is used. Two products are cheaper in countries with low tariffs on final products on both of the measures; and four products on at least one of the measures. One product (Indinavir) is less than half the price in high tariff countries on both measures, while the others are up to 18% cheaper. However, the Indinavir result is based on price data from only one low-tariff country (Malaysia). Conversely, twelve of the sixteen products are cheaper in high-tariff countries on both of the measures, and thirteen on at least one measure. Eight products are at least 40% cheaper based on the arithmetic mean, and seven products based on the geometric mean.

This pattern, of lower prices for a majority of products in high tariff countries, applies across all three patent categories. At first sight, it appears weakest in the drugs still under patent, where only three of the five products are cheaper in high tariff countries on both measures. Again, however, this is heavily dependent on the Indinavir result. Setting this aside means that three out of four products are 29-49% cheaper in high tariff countries based on the arithmetic mean, the remaining product being 6% more expensive; and that all products are between 18% and 53% cheaper in high tariff countries based on the geometric mean.

Two of the three “expiring patent” products are cheaper in high tariff countries, by between 54% and 85%, while one product is 17-18% cheaper in low tariff countries. All but one of the “multi-source” products are between 13% and 56% cheaper in high-tariff countries based on either of the measures, while Metformin is the same price based on the arithmetic mean and 13% cheaper in low-tariff countries based on the geometric mean.

The results of the analysis for tariffs on active ingredients show a similar, if slightly weaker, pattern. Four products are cheaper in low-tariff countries on both measures, and five on at least one; and the price differences in these cases are somewhat greater than for tariffs on final products (at least based on the arithmetic mean, with three products between 27% and 38% cheaper). Conversely, eleven products are cheaper in high-tariff countries, and twelve on at least one; and seven products are at least 30% cheaper. Again, this pattern applies across all three patent categories, and appears marginally stronger in the “multi-source” category (75% and 88% of products cheaper on the two measures, 38% and 62% by at least 40%) than for the patented category (60% cheaper, 20% and 40% by at least 40%). However, the small number of products in each category makes this finding unreliable.

This analysis suggests that tariffs have the opposite effect on final product prices to that predicted by an uncritical application of neoclassical trade theory: higher tariffs on final products are associated with lower product prices for around 80-85% of the pharmaceutical products considered; and that higher tariffs on active ingredients are associated with lower final product prices for 70-80% of products (depending on whether Indinavir is included in the analysis despite the very small country samples, and in the latter case whether the arithmetic or the geometric mean is used). Moreover, the scale of the price differences for those products which are cheaper in high-tariff countries is substantially greater, not only than where the price difference is the other way around, but also than the level of tariffs themselves.

The most obvious explanation for this is that prices are held down by the availability of low-cost domestic production; and that tariffs help to maintain the viability of domestic pharmaceutical producers. It is noteworthy that, of the six countries listed by Bale (2001) as accounting for two-thirds of the total pharmaceutical output of the Third World, four (India, Argentina, Brazil and Mexico) are included in the eight countries with the highest tariffs on medicaments or active ingredients listed in the annex to the same paper.

As one would expect, given overall price differentials of 300-5,800% and tariff differences in the order of 10-30%, there is generally a greater degree of variation *within* each of the tariff categories than *between* their respective averages, for both types of tariff, and for both the arithmetic and geometric means. This is consistent with other domestic and international factors being of substantially greater importance than tariffs as determinants of final prices. If the assessment above, that variations in local costs and non-trade taxes may reduce prices in the lowest-cost countries relative to the highest-cost countries, the effects of tariffs may be somewhat stronger (as the greatest effects recorded here suggest a factor of 3-7 for some products). However, the effects of international factors are likely to be somewhat greater than those of tariffs.

These findings suggest that the Director General of the International Federation of Pharmaceutical Manufacturers Associations may be overstating the case somewhat when he asserts (without supporting argument or evidence) in his Working Paper for Working Group 4 of the Commission on Macroeconomics and Health that "tariffs can be *an especially important* factor in determining the end-user price [of pharmaceuticals] for developing countries" (Bale, 2001, p10; emphasis added). More importantly, however, while Bale does not indicate the direction in which he assumes this effect to operate, it appears from this analysis to be the opposite of that which he presumably intended.

It should be noted, however, the analytical methodology used here is a simple one, with no attempt to control for other variables which might affect the analysis; and there are some products for which prices are higher in high tariff countries. While the analysis therefore suggests a need for considerable caution in advocating reductions in tariffs on final pharmaceutical products and active ingredients as a means of reducing prices, there is also a case both for a more complete, systematic and rigorous analysis of the issue, and a further investigation of the differences between the nature of and markets for those products which appear to show effects of tariffs which operate in different directions. It also seems likely that the direction of the effects of tariffs on final prices will vary between countries. Further analysis is also required to assess the circumstances in which there effects are positive or negative.

V Tariff Reduction, Government Revenues and Health Expenditure

As discussed above, import tariffs account for a relatively small part of inter-country variations in the prices of inputs required for health interventions; but their removal might be expected to have a small but significant effect in increasing the utilisation of insecticide-treated bednets (in the order of ½-3% of the population in a typical Sub-Saharan country, but probably substantially less elsewhere); and further analysis might reveal favourable price effects for at least some pharmaceutical products in some countries.

However, any potential cost reductions associated with tariff reductions will be at least partly off-set by the associated losses of government revenue. If the resources which accrue to the government are used for health-promoting expenditures, the net effect on the public finances of reducing or eliminating tariffs on health-related inputs will be zero where they are purchased by the public sector, and negative where they are purchased privately. In the former case, an equivalent effect could be achieved by transferring resources from other sectors to the health system. In the latter case, there is a potentially adverse effect on other health-related public expenditures, which would partly off-set any potential health benefits from lower drug prices.

The revenue issue is a critical one in many low-income countries, especially in Sub-Saharan Africa, which are critically dependent on import tariffs as a revenue source. Table 4 provides data on central government revenues for the 13 Sub-Saharan countries included in the CI/HAI data set, ordered by per capita income at purchasing-power parity.

Three of these countries (South Africa, Eritrea and Nigeria) have relatively strong public finances, with revenues of at least 30% of GDP. These countries also have a relatively limited dependence on trade taxes, which account for between 3% and 13% of total revenue (average 8½%).

The other countries, however, have much weaker revenues, between 10% and 18% of GDP, and in three cases (Uganda, Mozambique and Tanzania) just 10-11% of GDP. These countries are much more heavily, and in some cases critically dependent on trade taxes, which account for between 13% and 48% of revenues (average 29%). At these levels of government revenue, the resulting low level of resources available for recurrent spending[7] is a serious constraint on health services and related activities; and a reduction in resources available for these uses is likely to have a significant adverse effect on health.

As shown in the penultimate column of the Table, if the expenditure reduction associated with a 1% reduction in trade taxes were applied only to health expenditure (including capital expenditure), this would result in a reduction in a reduction of more than 1% in health spending in most countries, and in many cases between 2½% and 4½%. More realistically, if it were applied equally to non-interest recurrent public spending in all sectors, as shown in the final column, a 1% reduction in trade taxes would result in a reduction in recurrent spending on health of between 0.3% and 0.7% in seven of the 13 countries.

[7] Capital expenditure in these countries is typically financed almost wholly by aid receipts, but these are generally much more limited for recurrent expenditures.

The revenue effects will be most acute where purchases are financed primarily from private expenditure, as the loss of revenue will substantially outweigh the cost reduction to the public sector. This applies particularly to consumer products such as bednets and the insecticides for treating then (or, for example, condoms), but also to pharmaceuticals in many countries (especially low-income countries) where patients purchase their own medications rather than receiving them through public sector health services as in many developed countries.

Moreover, the pattern of exemptions, waivers and reliefs suggest that the greatest effect of tariff reductions will be on the private-for-profit sector, which is also the sector where the trade-off between price reductions for end-users and revenue losses is likely to be least favourable, as the lowering of taxes may be at least partly absorbed by higher profits. For non-health-specific products (eg pesticides), imports for non-health uses will typically represent a large proportion of the total, as well as expenditure coming largely from private sources, further accentuating the trade-off with public finance.

In the case of pesticides (specifically DDT), there is also a risk that reducing the price through the removal of trade barriers would promote increased use in agriculture, with possible adverse health effects through food safety and exposure of agricultural workers.

VI Conclusions

This paper suggests:

(a) that eliminating tariffs on bednets and the insecticides for treating them could increase utilisation by between about ½% and 3% in a typical Sub-Saharan country, but probably substantially less in other regions;

(b) that reducing tariffs on pharmaceuticals and the active ingredients required for their production appears more likely to *increase* final pharmaceutical prices than to reduce them overall, by undermining low-cost domestic producers;

(c) that both for pharmaceuticals and ITNs, other domestic and international factors affecting prices are likely to be of substantially greater significance than tariffs as price determinants (and that non-price factors may be more important than prices as a determinant of ITN use); and

(d) that even where tariff reduction has the potential to reduce prices, the associated revenue loss may have a significant impact on public sector recurrent health spending, at least in some Sub-Saharan countries, so that the trade-off between price reduction (and the associated effect on utilisation) and government revenue losses needs to be taken into account.

The findings on pharmaceutical prices suggest a very firm conclusion that efforts to lower the cost of essential drugs should focus on domestic factors (particularly distribution costs and wholesale and retail mark-ups) and international factors (such as competitiveness in international markets and international intellectual property régimes), and not on tariff reduction. It also suggests a need for a careful assessment of the actual effects of medicament and active-ingredient tariffs on pharmaceutical prices in developing countries before further reductions are undertaken in the context of broader trade liberalisation, for example as part of structural reform programmes or the General Agreement on Tariffs and Trade.

The importance of sustaining domestic pharmaceutical companies with the capacity to produce high-quality generic drugs – and thus potentially of retaining pharmaceutical tariffs in those countries where such an industry exists – is greatly increased by the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (the TRIPs agreement), as the main safeguard against the price increases associated with strengthened intellectual property protection for pharmaceuticals is the provision for compulsory licensing, which depends on the existence of a domestic pharmaceutical industry.

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Table 1: Prices, Tariffs and Domestic Taxes on Untreated Bednets

	retail price			tariff		taxes		net price		possible price reduction			
	year	min	max	year	%	year	%	min	max	tariffs	taxes	other (min)	other (max)
Côte d'Ivoire	2001	3.41	4.09	2001	0	2001	0.0	3.41	4.09	0.0	0.0	10.9	25.7
Ethiopia	2001	6.40		1997	10	1997	12.0	5.19		9.1	10.7	41.5	
Gambia	2001	13.42		1998	4-60	1998	10.0	11.73		3.8	9.1	74.1	
Ghana	2001	7.14	10.00	1998	25	1998	15.0	4.97	6.96	20.0	13.0	38.9	56.3
Kenya	2001	4.48		1996	25	1998	*18.0	*3.04		20.0	15.3	0.0	
Mozambique	2000	15.00	20.00	1993	30	1997	17.0	9.86	13.15	23.1	14.5	69.2	76.9
Namibia	2000	6.75		2001	20	1997	15.0	4.89		16.7	13.0	37.9	
Nigeria	2001	3.64	9.09	2001	5	2001	13.5	3.05	7.63	4.8	11.9	0.6	60.2
Senegal	2000	8.00	16.00	2000	42	2000	20.0	4.69	9.39	29.6	16.7	35.3	67.7
South Africa	1999	8.14		2001	20	1997	25.4	5.41		16.7	20.3	43.9	
Sudan	1999	30.00		1998	25	1998	n/a	n/a		20.0	87.3		
Uganda	2001	4.59	18.00	2000	0	2000	0.0	4.59	18.00	0.0	0.0	33.8	83.1
Zambia	2001	5.39	8.99	2000	0	2000	0.0	5.39	8.99	0.0	0.0	43.6	66.2
Zimbabwe	2001	27.29		1997	20	1997	21.0	18.79		16.7	17.4	83.8	

Notes: net price is the price net of taxes, reduced on the assumption that all local costs are reduced proportionally as border price plus tariff is reduced. "Other" possible price reduction refers to reduction of the net price to the lowest recorded (that for Kenya).
* The tax figure for Kenya excludes excise tax, for which no data are provided. In consequence, the "net price" for Kenya includes an unknown amount of excise tax. All data are from Simon et al (2001), Tables 1 (tariffs and taxes) and 3 (prices). Tables with no price data after 1997 are excluded.

Table 2: Summary of Results: Tariffs on Medicaments

	country sample		arithmetic mean			geometric mean		
product	high tariff	low tariff	high tariff	low tariff	ratio, high/low	high tariff	low tariff	ratio high/low
under patent								
Ceftriaxone Sodium, 1000mg	8	4	1237	2319	0.53	1041	2231	0.47
Indinavir, 400mg	3	1	293	135	2.17	283	135	2.10
Lamivudine, 150mg	6	6	323	456	0.71	283	423	0.67
Simvastatine, 20mg	7	5	147	289	0.51	127	262	0.48
Zidovudine, 300mg	7	6	478	450	1.06	342	416	0.82
patents expiring								
Ciprofloxacin, 500mg	9	5	89	300	0.30	41	282	0.15
Fluconazole, 150mg	8	5	916	748	1.22	597	496	1.20
Omeprazole, 20mg	9	6	66	144	0.46	38	110	0.35
multi-source								
Acyclovir, 800mg	9	6	270	563	0.48	220	378	0.58
Atenolol, 100mg	10	6	18	25	0.72	38	43	0.88
Captopril, 50mg	10	6	35	58	0.60	23	48	0.48
Diclofenac, 50mg	10	6	9	15	0.60	12	19	0.63
Diltiazem, 60mg	6	5	12	31	0.39	16	36	0.44
Metformin, 500mg	9	6	9	9	1.00	15	13	1.15
Nifedipine, 20mg	10	5	27	33	0.82	17	23	0.74
Ranitidine, 300mg	10	5	41	47	0.87	64	75	0.85

Table 3: Summary of Results: Tariffs on Active Ingredients

	country sample		arithmetic mean			geometric mean		
product	**high tariff**	**low tariff**	**high tariff**	**low tariff**	**ratio, high/low**	**high tariff**	**low tariff**	**ratio high/low**
under patent								
Ceftriaxone Sodium, 1000mg	4	5	1388	2069	0.67	1023	1926	0.53
Indinavir, 400mg	2	3	272	247	1.10	271	224	1.21
Lamivudine, 150mg	4	8	402	458	0.88	342	431	0.79
Simvastatine, 20mg	4	7	157	249	0.63	222	269	0.83
Zidovudine, 300mg	5	8	638	464	1.38	506	413	1.23
patents expiring								
Ciprofloxacin, 500mg	5	7	139	224	0.62	71	149	0.48
Fluconazole, 150mg	5	5	1106	748	1.48	566	496	1.14
Omeprazole, 20mg	5	8	39	89	0.44	114	120	0.95
multi-source								
Acyclovir, 800mg	6	8	406	478	0.85	281	329	0.85
Atenolol, 100mg	6	8	29	36	0.81	20	21	0.95
Captopril, 50mg	5	8	27	52	0.52	20	43	0.47
Diclofenac, 50mg	5	8	29	18	1.61	10	15	0.67
Diltiazem, 60mg	6	5	20	36	0.56	16	36	0.44
Metformin, 500mg	3	8	9	13	0.69	7	10	0.70
Nifedipine, 20mg	6	7	39	32	1.22	26	25	1.04
Ranitidine, 300mg	6	7	55	71	0.77	31	50	0.62

Table 4: Dependence on Trade Taxes in Sub-Saharan African Countries

	GNP pc, 1999 (PPP $)	government revenue, 1998 (% of GDP)	trade taxes, 1998 (% of revenue)	public spending on health, 1990-98 (% of GDP)	non-interest recurrent public spending	1% change in trade taxes as % of	
						public spending on health	non-interest recurrent public spending
South Africa	8710	30.7	3.4	3.2	28.2	0.3	0.04
Cameroon	1490	15.3	16.9	1.0	14.3	2.6	0.18
Senegal	1400	17.1	23.7	2.6	11.9	1.6	0.34
Togo	1380	15.3	42.9	1.1	18.0	6.0	0.36
Uganda	1160	10.9	44.1	1.8	9.8	2.7	0.49
Eritrea	1040	37.0	13.0	2.9	48.3	1.7	0.10
Burkina Faso	960	16.5	25.3	1.2	11.1	3.5	0.38
Benin	920	14.8	48.4	1.6	10.8	4.5	0.66
Mozambique	810	10.5	16.9	2.1	12.2	0.9	0.15
Nigeria	770	30.5	9.3	0.2	16.3	14.2	0.17
Zambia	720	17.6	25.5	2.9	14.3	1.6	0.31
Malawi	570	16.6	13.3	3.3	16.3	0.7	0.14
Tanzania	500	10.6	31.7	1.1	9.9	3.1	0.34

Sources: World Bank: *Global Development Indicators, 2001* and *African Development Indicators, 2001.*

Annex I: Results of Analysis for Individual Products

Explanatory Notes

Countries are shown in order of product prices, based on consolidated data, as described in the text. The tariff categories (low or high) into which each country falls are shown in the second and third columns, for medicaments (med.) and active ingredients (act. ing.) respectively. The next three columns show the arithmetic (A) and geometric (G) means of product prices for the low and high tariff categories for medicaments, and the number of countries for which price data are available (N). The final three columns show the same information for the low and high tariff categories for active ingredients. As a visual aid, the average price indicators are placed approximately in line with the country price figures in the second column; and, since arithmetic and geometric means are not directly comparable, they are in italics and bold respectively, to minimise confusion.

Ceftriaxone Sodium, 1000mg									
		tariff category		average of tariff categories					
	price	med.	act. ing.	med.	N	price	act. ing.	N	price
South Africa	3403	low	low						
Argentina	2666	-	high						
Malaysia	2342	low	low	*low (A)*	*4*	*2319*			
Burkina Faso	1864	high	-	**low (G)**	**4**	**2231**	*low (A)*	*5*	*2069*
Indonesia	1855	low	low				**low (G)**	**5**	**1926**
Nigeria	1805	high	-						
Peru	1775	high	high						
Cameroon	1736	high	-						
Nicaragua	1676	low	low	*high (A)*	*8*	*1237*	*high (A)*	*4*	*1388*
Uganda	1070	high	low	**high (G)**	**8**	**1041**	**high (G)**	**4**	**1023**
Bolivia	835	high	high						
Pakistan	536	high	-						
India	277	high	high						
Malawi	-	high	low						
Mozambique	-	low	low						
Tanzania	-	high	high						
Zambia	-	low	low						
Brazil	-	-	high						

Indinavir, 400mg									
		tariff category		**average of tariff categories**					
	price	**med.**	**act. ing.**	**med.**	**N**	**price**	**act. ing.**	**N**	**price**
Malawi	395	high	low	*high (A)*	*3*	*293*			
Burkina Faso	274	high	-	**high (G)**	**3**	**283**	**high (G)**	**2**	**271**
Peru	274	high	high				*high (A)*	*2*	*271*
Brazil	269	-	high				*low (A)*	*3*	*247*
Uganda	210	high	low				**low (G)**	**3**	**224**
Malaysia	135	low	low	*low (A)*	*1*	*135*			
Cameroon	-	high	-	**low (G)**	**1**	**135**			
Mozambique	-	low	low						
Nigeria	-	high	-						
South Africa	-	low	low						
Tanzania	-	high	high						
Zambia	-	low	low						
India	-	high	high						
Indonesia	-	low	low						
Pakistan	-	high	-						
Argentina	-	-	high						
Bolivia	-	high	high						
Nicaragua	-	low	low						

Lamivudine 150mg									
		tariff category		**average of tariff categories**					
	price	**med.**	**act. ing.**	**med.**	**N**	**price**	**act. ing.**	**N**	**price**
Mozambique	810	low	low						
Argentina	555	-	high						
Brazil	536	-	high						
Malawi	530	high	low						
Nicaragua	467	low	low						
South Africa	455	low	low	*low (A)*	*6*	*456*	*low (A)*	*8*	*457*
Zambia	438	low	low	**low (G)**	**6**	**423**	**low (G)**	**8**	**431**
Peru	400	high	high				*high (A)*	*4*	*401*
Uganda	395	high	low						
Malaysia	348	low	low						
Nigeria	340	high	-	*high (A)*	*6*	*323*	**high (G)**	**4**	**342**
Indonesia	217	low	low	**high (G)**	**6**	**283**			
Burkina Faso	158	high	-						
India	115	high	high						
Cameroon	-	high	-						
Tanzania	-	high	high						
Pakistan	-	high	-						
Bolivia	-	high	high						

Simvastatine, 20mg									
		tariff category		**average of tariff categories**					
	price	**med.**	**act. ing.**	**med.**	**N**	**price**	**act. ing.**	**N**	**price**
Mozambique	520	low	low						
Argentina	358	-	high						

Brazil	344	-	high						
Indonesia	284	low	low	*low (A)*	*5*	*289*			
South Africa	262	low	low	**low (G)**	**5**	**261**	*low (A)*	*7*	*269*
Nicaragua	257	low	low				**low (G)**	**7**	**248**
Malawi	224	high	low				*high (A)*	*4*	*222*
Uganda	214	high	low						
Burkina Faso	174	high	-						
Bolivia	154	high	high	*high (A)*	*7*	*147*	**high (G)**	**4**	**157**
Malaysia	123	low	low	**high (G)**	**7**	**127**			
Cameroon	117	high	-						
Pakistan	112	high	-						
India	32	high	high						
Nigeria	-	high	-						
Tanzania	-	high	high						
Zambia	-	low	low						
Peru	-	high	high						

Zidovudine, 300mg									
		tariff category		average of tariff categories					
	price	med.	act. ing.	med.	N	price	act. ing.	N	price
Bolivia	1287	high	high						
Malawi	810	high	low						
Mozambique	732	low	low						
Brazil	660	-	high						
Nicaragua	660	low	low				*high (A)*	*5*	*638*
Argentina	606	-	high				**high (G)**	**5**	**506**
Peru	513	high	high	*high (A)*	*7*	*478*	*low (A)*	*8*	*464*
Malaysia	405	low	low	*low (A)*	*6*	*449*	**low (G)**	**8**	**413**
South Africa	330	low	low	**low (G)**	**6**	**416**			
Zambia	318	low	low	**high (G)**	**7**	**342**			
Indonesia	252	low	low						
Pakistan	243	high	-						
Uganda	202	high	low						
Burkina Faso	165	high	-						
India	126	high	high						
Cameroon	-	high	-						
Nigeria	-	high	-						
Tanzania	-	high	high						

Ciprofloxacin, 500mg									
		tariff category		average of tariff categories					
	price	med.	act. ing.	med.	N	price	act. ing.	N	price
South Africa	456	low	low						
Zambia	340	low	low						
Mozambique	318	low	low						
Peru	309	high	high	*low (A)*	*5*	*300*			
Nigeria	258	high	-	**low (G)**	**5**	**282**			
Brazil	258	-	high						
Indonesia	224	low	low				*low (A)*	*7*	*224*
Nicaragua	162	low	low				**low (G)**	**7**	**149**
Bolivia	93	high	high	*high (A)*	*9*	*89*	*high (A)*	*5*	*139*

Malawi	46	high	low	**high (G)**	**9**	**41**	**high (G)**	**5**	**71**
Pakistan	31	high	-						
Tanzania	25	high	high						
Uganda	20	high	low						
India	10	high	high						
Burkina Faso	6	high	-						
Cameroon	-	high	-						
Malaysia	-	low	low						
Argentina	-	-	high						

Fluconazole, 150mg									
		tariff category		average of tariff categories					
	price	med.	act. ing.	med.	N	price	act. ing.	N	price
Tanzania	2312	high	high						
Brazil	2191	-	high						
South Africa	1952	low	low						
Burkina Faso	1275	high	-						
Cameroon	1194	high	-						
Nigeria	1188	high	-	*high (A)*	*8*	*916*	*high (A)*	*5*	*1106*
Malaysia	697	low	low	*low (A)*	*5*	*748*	*low (A)*	*5*	*748*
Peru	650	high	high						
Nicaragua	646	low	low	**high (G)**	**8**	**596**	**high (G)**	**5**	**566**
Mozambique	349	low	low	**low (G)**	**5**	**496**	**high (G)**	**5**	**566**
Pakistan	333	high	-						
Bolivia	322	high	high						
Zambia	98	low	low						
India	55	high	high						
Malawi	-	high	low						
Uganda	-	high	low						
Indonesia	-	low	low						
Argentina	-	-	high						

Omeprazole, 20mg									
		tariff category		average of tariff categories					
	price	med.	act. ing.	med.	N	price	act. ing.	N	price
Brazil	394	-	high						
South Africa	281	low	low						
Cameroon	217	high	-						
Malaysia	180	low	low						
Nicaragua	166	low	low						
Indonesia	165	low	low	*low (A)*	*6*	*144*	*low (A)*	*8*	*120*
Bolivia	99	high	high	**low (G)**	**6**	**110**	*high (A)*	*5*	*114*
Nigeria	84	high	-				**low (G)**	**8**	**89**
Malawi	63	high	low	*high (A)*	*9*	*66*			
Peru	61	high	high						
Mozambique	42	low	low						
Uganda	36	high	low	**high (G)**	**9**	**38**	**high (G)**	**5**	**39**
Zambia	30	low	low						
Pakistan	17	high	-						

Tanzania	10	high	high
India	4	high	high
Burkina Faso	-	high	-
Argentina	-	-	high

Acyclovir, 800mg									
		tariff category		**average of tariff categories**					
	price	**med.**	**act. ing.**	**med.**	**N**	**price**	**act. ing.**	**N**	**price**
Indonesia	1484	low	low						
Brazil	932	-	high						
South Africa	790	low	low						
Nigeria	576	high	-						
Argentina	552	-	high	*low (A)*	*6*	*563*			
Mozambique	540	low	low				*low (A)*	*8*	*478*
Peru	440	high	high	**low (G)**	**6**	**378**	*high (A)*	*6*	*406*
Pakistan	296	high	-				**low (G)**	**8**	**329**
Malawi	288	high	low				**high (G)**	**6**	**281**
Bolivia	268	high	high	*high (A)*	*9*	*270*			
Nicaragua	264	low	low						
Zambia	216	low	low	**high (G)**	**9**	**220**			
Tanzania	200	high	high						
Uganda	164	high	low						
Cameroon	158	high	-						
Malaysia	81	low	low						
India	41	high	high						
Burkina Faso	-	high	-						

Atenolol, 100mg									
		tariff category		**average of tariff categories**					
	price	**med.**	**act. ing.**	**med.**	**N**	**price**	**act. ing.**	**N**	**price**
Cameroon	212	high	-						
South Africa	109	low	low						
Brazil	86	-	high						
Indonesia	78	low	low						
Burkina Faso	57	high	-	*low (A)*	*6*	*43*			
Mozambique	41	low	low				*low (A)*	*8*	*36*
Bolivia	38	high	high	*high (A)*	*10*	*38*	*high (A)*	*6*	*29*
Argentina	20	-	high	**low (G)**	**6**	**25**	**low (G)**	**8**	**21**
Malaysia	16	low	low	**high (G)**	**10**	**18**	**high (G)**	**6**	**20**
Peru	15	high	high						
Uganda	14	high	low						
Malawi	12	high	low						
Nicaragua	10	low	low						
Tanzania	8	high	high						
India	8	high	high						
Nigeria	7	high	-						
Pakistan	6	high	-						
Zambia	4	low	low						

Captopril, 50mg									
		tariff category		average of tariff categories					
	price	med.	act. ing.	med.	N	price	act. ing.	N	price
South Africa	96	low	low						
Cameroon	86	high	-						
Burkina Faso	83	high	-						
Malaysia	81	low	low						
Indonesia	80	low	low						
Argentina	51	-	high	*low (A)*	*6*	*58*	*low (A)*	*8*	*52*
Malawi	50	high	low	**low (G)**	**6**	**48**			
Nicaragua	44	low	low				**low (G)**	**8**	**43**
Peru	35	high	high	*high (A)*	*10*	*35*			
Bolivia	34	high	high						
Mozambique	32	low	low				*high (A)*	*5*	*27*
Uganda	20	high	low	**high (G)**	**10**	**23**	**high (G)**	**5**	**20**
Zambia	14	low	low						
Tanzania	12	high	high						
Pakistan	11	high	-						
Nigeria	10	high	-						
India	4	high	high						
Brazil	-	-	high						

Diclofenac, 50mg									
		tariff category		average of tariff categories					
	price	med.	act. ing.	med.	N	price	act. ing.	N	price
Argentina	118	-	high						
South Africa	30	low	low						
Mozambique	29	low	low				*high (A)*	*5*	*29*
Indonesia	28	low	low						
Nigeria	27	high	-						
Cameroon	26	high	-						
Malawi	22	high	low	*low (A)*	*6*	*19*	*low (A)*	*8*	*18*
Peru	15	high	high	**low (G)**	**6**	**15**	**low (G)**	**8**	**15**
Malaysia	11	low	low	*high (A)*	*10*	*12*			
Nicaragua	10	low	low				**high (G)**	**5**	**10**
Uganda	9	high	low	**high (G)**	**10**	**9**			
Bolivia	8	high	high						
Burkina Faso	6	high	-						
Pakistan	6	high	-						
Zambia	5	low	low						
Tanzania	3	high	high						
India	2	high	high						
Brazil	-	-	high						

Diltiazem, 60mg									
		tariff category		average of tariff categories					
	price	med.	act. ing.	med.	N	price	act. ing.	N	price
South Africa	64	low	low						

Nicaragua	48	low	low						
Mozambique	37	low	low						
Brazil	35	-	high	*low (A)*	*5*	*36*	*low (A)*	*5*	*36*
Burkina Faso	31	high	-	**low (G)**	**5**	**31**	**low (G)**	**5**	**31**
Argentina	31	-	high						
Peru	26	high	high						
Bolivia	19	high	high				*high (A)*	*6*	*20*
Malaysia	18	low	low	*high (A)*	*6*	*16*	**high (G)**	**6**	**16**
Indonesia	13	low	low	**high (G)**	**6**	**12**			
Tanzania	6	high	high						
Pakistan	6	high	-						
India	5	high	high						
Cameroon	-	high	-						
Malawi	-	high	low						
Nigeria	-	high	-						
Uganda	-	high	low						
Zambia	-	low	low						

Metformin, 500mg									
		tariff category		**average of tariff categories**					
	price	**med.**	**act. ing.**	**med.**	**N**	**price**	**act. ing.**	**N**	**price**
Nigeria	50	high	-						
Cameroon	28	high	-						
Nicaragua	26	low	low						
Mozambique	22	low	low						
South Africa	19	low	low						
Peru	14	high	high	*high (A)*	*9*	*15*			
Uganda	11	high	low	*low (A)*	*6*	*13*	*low (A)*	*8*	*13*
Tanzania	10	high	high	**low (G)**	**6**	**9**	**low (G)**	**8**	**10**
Malawi	9	high	low	**high (G)**	**9**	**9**	*high (A)*	*3*	*9*
Indonesia	7	low	low				**high (G)**	**3**	**7**
Burkina Faso	6	high	-						
Zambia	3	low	low						
Malaysia	3	low	low						
India	2	high	high						
Pakistan	2	high	-						
Argentina	-	-	high						
Brazil	-	-	high						
Bolivia	-	high	high						

Nifedipine, 20mg									
		tariff category		**average of tariff categories**					
	price	**med.**	**act. ing.**	**med.**	**N**	**price**	**act. ing.**	**N**	**price**
Brazil	90	-	high						
South Africa	85	low	low						
Bolivia	50	high	high						
Nigeria	47	high	-						
Peru	44	high	high						
Cameroon	39	high	-				*high (A)*	*6*	*39*

Mozambique	36	low	low						
Malawi	32	high	low	*low (A)*	*5*	*33*	*low (A)*	*7*	*32*
Uganda	30	high	low						
Argentina	28		high	*high (A)*	*10*	*27*	**high (G)**	**6**	**26**
Nicaragua	22	low	low	**low (G)**	**5**	**23**	**low (G)**	**7**	**25**
Tanzania	19	high	high						
Malaysia	16	low	low	**high (G)**	**10**	**17**			
Zambia	6	low	low						
Pakistan	4	high	-						
India	3	high	high						
Burkina Faso	2	high	-						
Indonesia	-	low	low						

Ranitidine, 300mg									
		tariff category		**average of tariff categories**					
	price	**med.**	**act. ing.**	**med.**	**N**	**price**	**act. ing.**	**N**	**price**
South Africa	221	low	low						
Burkina Faso	210	high	-						
Brazil	177	-	high						
Cameroon	100	high	-						
Nigeria	82	high	-						
Uganda	72	high	low	*low (A)*	*5*	*75*	*low (A)*	*7*	*71*
Indonesia	70	low	low	*high (A)*	*10*	*64*			
Argentina	54	-	high				*high (A)*	*6*	*55*
Malaysia	52	low	low				**low (G)**	**7**	**50**
Malawi	45	high	low	**low (G)**	**5**	**47**			
Tanzania	36	high	high	**high (G)**	**10**	**41**			
Peru	36	high	high						
Pakistan	26	high	-				**high (G)**	**6**	**31**
Bolivia	26	high	high						
Nicaragua	20	low	low						
Zambia	14	low	low						
India	3	high	high						
Mozambique	-	low	low						