

Background paper

**Essential Medicines for Non-Communicable Diseases
(NCDs)**

Essential Medicines for Non-Communicable Diseases (NCDs)

Dele Abegunde

Health Economist (Pricing and financing), Medicine Access and Rational Use

Essential medicines and Pharmaceutical Policies

World Health Organization, Geneva.

Acknowledgements

Reviews and contributions most gratefully received from:

Clive Ondari

Richard Laing

Hans Hogerzeil

Shanthi Mendis

Annemiek van Bolhuis

Abstract

Cost-effective medicines to treat noncommunicable diseases (NCDs) are available and in mostly low cost generic forms although they remain inaccessible and unaffordable to many who need them especially in low- and middle-income countries where the prevalence of NCDs are increasing. Scaling up access to NCD medicines is critical to global efforts to ameliorate the burden of NCDs and also in achieving the millennium development goals (MDGs). However, challenges to scaling up access to NCD medicines reflect each country's situation and need to be addressed in a country specific way to achieve sustainable and equitable accessibility. This can be achieved by a combination of policies and programmatic options suited to countries' situation. Concerted global efforts are important for improving access to NCD medicines and the emergence of a NCD global health initiative (GHI) could be a viable platform. Governments, in collaboration with the private sector, should give greater priority to treating chronic diseases and improving the accessibility of medicines to treat them. Important mechanisms for providing sustainable access to NCDs include efficient procurement and distribution of these medicines in countries, establishment or the provision of viable financing options, generic promotion policies and the development and use of evidence based guidelines for the treatment of NCDs.

Keywords: Essential medicines, Noncommunicable diseases, Policy

Introduction

The burden of noncommunicable diseases (NCDs) continues to increase in the low- and middle-income countries despite the widely available evidence for effective interventions. Chronic diseases—mainly cardiovascular disease, cancer, chronic respiratory diseases, and diabetes—were estimated to cause more than 60% (35 million) of all deaths in 2005; more than 80% of these deaths occurred in low-income and middle-income countries [1]. NCDs have negative impact on individuals, and family economic production and wellbeing. NCDs also have the potential to significantly undermine national macroeconomic development. For example, estimated loss in national income from heart diseases, stroke and diabetes in 2005 were \$18 billions in China, \$11 billion in the Russian Federation, \$9 billion in India and \$43 billion in Brazil. These losses accumulate over time. It is estimated that between 2005 and 2015 it is estimated that China would have lost \$558 billion in foregone national income due to heart disease, stroke and diabetes alone [1-4].

The burden of chronic noncommunicable diseases cannot be reduced without equitable access to essential medicines. Access to appropriate medicines for treating NCDs is crucial for both population- and individual-based intervention strategies. The use of NCD medicines for addressing NCD burden represents a major intervention technology by itself and is a critical component of diagnostic, investigatory, treatment follow-up and monitoring systems. NCD medicines are an essential component of the treatment of cardiovascular diseases, diabetes, chronic respiratory diseases (i.e. chronic obstructive pulmonary disease, asthma), many cancers (including for palliative care), mental and neurological disorders. Mental, neurological, and substance use (MNS) disorders are also common in all regions of the world, and 14% of the global burden of disease is attributed to these disorders. Despite the prevalence and burden of these disorders, a large proportion of people with such problems do not receive treatment and care¹ [5, 6].

¹ A large multi-country survey supported by WHO showed that 35–50% of serious cases in developed countries and 76–85% in less-developed countries had received no treatment in the previous 12 months. A

Medicines are essential in primary and secondary prevention of noncommunicable diseases. It is estimated that the appropriate use of medicines alone can reduce up to 80% of the burden of noncommunicable diseases in many countries.

Notwithstanding the critical importance of medicines in addressing the burden of NCDs (and some predisposing risk factors), they largely remain inaccessible to many who need them in mostly in the low- and middle-income countries. The inaccessibility is due to intricate interrelationships between delivery (supply and distribution) and utilization (demand) factors most of which can arguably be addressed with carefully designed strategies. For instance, the available evidence from most low- and middle-income countries indicates that access to essential medicines for the treatment of the most common acute communicable diseases is inadequate [7, 8]. Recent surveys in over 40 countries showed that in the public and private sector, generic medicines for the treatment of acute diseases were available in 56.1% and 65.6% respectively. For NCD medicines availability was only 36% and 54.7% [9-12]. Similarly, only 15% of the lower income countries reported availability of medicines for treating mental and neurological conditions compared to 40% in the upper middle income countries.

Although medicines are essential to NCD intervention strategies, they are largely excluded from insurance cover and reimbursements in many countries where health insurance is available. Chronic treatment puts an enormous and continuous financial strain on household budgets. From the time of diagnosis, individuals with chronic diseases will need to consistently use medicines (often on a daily basis) for the remainder of their lives. Medicines therefore can represent a significant proportion of family or household expenditure often competing with other essential household needs such as food and shelter. In most developing countries, the highest component of household health-related expenditure is on medicines which are obtained through out-of-pocket payments. Households and individuals are therefore constantly exposed to the impoverishing effects of compulsory spending of household income and wealth to purchase needed essential medicines. The costs of care in the acute phase of chronic NCDs

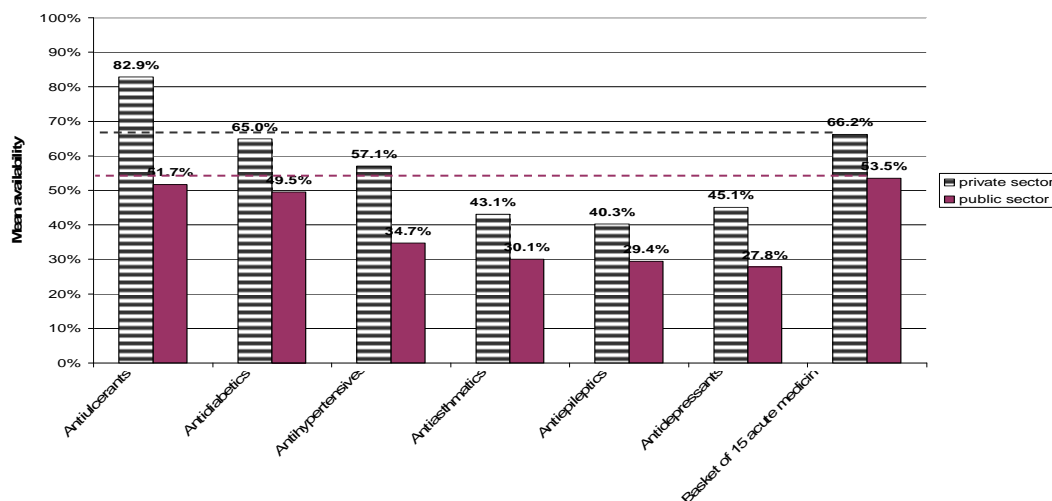
recent systematic review revealed the epilepsy treatment gap to be over 75% in low-income countries and

(hospitalizations, investigations, monitoring and especially the cost of medicines needed for treatment) also often constitute catastrophic health expenditure, pushing the households or the family below the poverty line early in the disease. In such marginal situations ensuring the availability of generic medicines in the public sector is likely to be the most cost-effective option. For example, in the Philippines purchasing originator brand atenolol would push an additional 22% of the population below the poverty line of US\$1.25 per day compared to 7% that would could have been so affected if the lowest priced generic equivalent was bought instead [13].

Notwithstanding the important role of medicines in addressing the burden of the major NCDs, availability and accessibility of these medicines continue to face challenges in many regions especially in the public sector of health sector (see figure 1). This article highlights some of these challenges and provides suggestions on policy and programmatic options for addressing these challenges globally and in countries. The following section discusses some of the challenges confronting access to medicines in countries; next is the discussion on the situation of specific groups of NCD medicines; and section C provides suggestion for policy and programmatic options for scaling up access to essential NCD medicines in countries. Subsequently, are the sections on global issues that affect access to NCD medicines (Section D) and the conclusions.

Figure 1: Average availability of medicines for the treatment of chronic diseases by therapeutic class, generics, all countries.

over 50% in most lower-middle and upper middle-income countries.



Challenges confronting access to medicines in countries.

1. *Weaknesses in health systems*

As many noncommunicable diseases share common risk factors, they also share common health systems related constraints that limit access to needed essential medicines. These shared constraints also provide opportunities for intervention and treatment synergies. Effective medicines exist to address the burden of most noncommunicable diseases. Many of these medicines are already listed in the WHO Model List of Essential Medicines and the WHO Model List of Essential Medicines for Children, as satisfying the priority health needs of the population. Nevertheless, NCD medicines are often unavailable in public facilities, and when these medicines are available only in the private outlets, prices are rarely affordable for the majority who need them. Low public sector availability of essential medicines is often caused by a lack of public resources due to underfunding or under-budgeting, inaccurate demand forecasting, and inefficient public sector procurement and distribution of medicines. This compels patients into the private sector, where medicines are relatively more available but costlier. Generic medicines are often 2-3 times more expensive in the private sector outlets [14]. Private sector preference for originator brand products further increases the price and makes treatment even more unaffordable. High private sector prices are caused by a high manufacturer's selling prices, taxes and tariffs, and high mark-ups in the supply chain.

2. *Fragmented and weak medicines supply and distribution systems*

In many countries with weak healthcare delivery systems, the default medicines supplies and distribution systems are highly fragmented by the activities of plethora of donors with resultant overlaps and duplication of distributions functions by the main players [3]. In many cases the public sector (government) role in supplies and distribution of medicines is rarely visible. In a recent mapping of the distribution systems in a number of Sub Saharan countries, the distribution and supplies of NCD medicines are not obvious.

Financing the demand for chronic NCD medicines: planning forecasting and budgeting

Total pharmaceutical expenditures are closely related to countries' GDP and to their total health expenditures. Expenditures on pharmaceuticals range from 1.35 to 1.5 percent per GDP, with the share of pharmaceutical expenditure of GDP being lower for higher income countries than for lower income countries. The share of pharmaceutical expenditure of the total health expenditure is also lower in rich countries than in poorer countries. There are differences in the sources of financing for medicines in developed and developing countries. In the developed countries, the public sector accounts for almost 60% of total pharmaceutical expenditures with government health insurance or social health security systems paying for most medicines. In developing countries, government pay less than a third of all expenditure on medicines and most payments are through private out of pocket expenditures [3]. Currently, there is lack of evidence on the adequacy of financing the procurement of NCD medicines in low- and middle-income countries.

A critical constraint to planning and forecasting quantities of NCD medicines need in countries is the lack of data and information necessary for any level of planning, forecasting and even budgeting for medicine needs. There are uncoordinated data generating activities in some countries; however, these data remain mostly unprocessed and do not provide useful policy-relevant evidence and information. An NGO for instance, is already providing support to some countries to capture medicines import data contained in unprocessed invoices in port offices. It is likely that such accumulation of unprocessed invoices is the case in many countries. Experience from the WHO NCD medicine need quantification exercises that was done to support the mid-term evaluation of the MDGs in 2009 indicates that only indirect approaches to quantification are presently feasible. A commonly employed approach is the quantification which combines available epidemiological and population (risk group) data, adjusted for estimates of treatment coverage. Yet the data required for quantification using this approach are mostly unavailable in countries. The National Health Account (NHA) project in the WHO obtains historical data of total pharmaceutical expenditures for countries. While these data provide some indication of the extent of medicines consumption in countries, there are so far little or no NCD-specific data.

3. *The challenge of quality of NCD medicines to Accessibility*

Medicine quality is also a problem especially in the low- and middle-income countries where limited local production compels cross border importation for the majority of local medicine need. For example, a recent survey in Rwanda showed that 20% of hypertensive medicines purchased in the market were of substandard content and 70% were of insufficient stability [15]. Similar results were found for other essential medicines in many other developing countries. The number of recorded cases of falsified (counterfeit) medicines for chronic diseases is also increasing, for example through unregulated internet sales used by patients on chronic treatment. Sub standard anti-diabetic traditional medicines were reported in 2009 in China to contain six times the normal dose of glibenclamide (two people died, nine were hospitalized)². Atorvastatin (for the treatment of obesity) was reported in the United States of America in 2007 to contain no active ingredient and was sold via Internet sites operated outside the USA [16]. In 2007, counterfeited olanzapine (for treating bipolar disorder and schizophrenia) was detected in the legal supply chain in the United Kingdom to be lacking sufficient active ingredient. There is growing number of counterfeit cases of medicines for lowering cholesterol. An example is the detection of fake Lipitor in 2006 in the United Kingdom, lacking sufficient active ingredient.³

Misperceptions by health care providers about the quality of generic medicines in many low- and middle-income countries motivates prescriber's preference for innovator medicines and branded generics which are more costly than generic brands. National supplies of essential NCD medicines could therefore be combined with quality assurance schemes to guarantee quality in these countries.

² Deadly counterfeit diabetes drug found outside China's Xinjiang, China View, 5 February 2009

³ [The Medicines and Healthcare products Regulatory Agency, United Kingdom](#)

4. Challenges from the state of the pharmaceutical workforce in countries

Insufficient pharmaceutical workforce (in numbers and skill mix) especially in the developing countries remains a significant barrier to access to NCD medicines. Shortages in the pharmaceutical workforce already constrain the safe, effective, efficient and timely distribution of medicines. Studies conducted in a few Sub-Saharan countries indicate that on the average, for every 10,000 Tanzanians, there are only 0.16 pharmacists and 0.11 pharmacy technicians [17]. Similar estimates of 0.93, 1.01, and 0.78 pharmacists per 10,000 population were recorded for Nigeria, Sudan and Ghana respectively [18]. This poor state of pharmaceutical workforce further compounds the low level availability of medicines in the public sector of these countries. The pharmaceutical workforce of many developing countries is also experiencing significant internal and external brain drain leading to even less trained skill especially in the rural areas.

A. The situation with the specific groups of NCD medicines.

1. Medicines for treating cardiovascular diseases

A survey of the availability and price of 32 NCD medicines conducted in Bangladesh, Brazil, Malawi, Nepal, Pakistan and Sri Lanka assessed the availability and affordability of medicines used to treat cardiovascular disease, diabetes, chronic respiratory disease and glaucoma and those for palliative cancer. This study estimated the percentage of these medicines available, the median price versus the international reference price (expressed as the median price ratio) and affordability in terms of the number of day's wages it would cost the lowest-paid government worker to purchase one month of treatment. In all countries 7.5% of these 32 medicines were available in the public sector, except in Brazil, where 30% were available, and Sri Lanka, where 28% were available. Median price ratios varied substantially, from 0.09 for losartan in Sri Lanka to 30.44 for aspirin in Brazil. In the private sector in Malawi and Sri Lanka, the cost of innovator products (the pharmaceutical product first given marketing authorization) was three times more than the generic medicines prices. One month of combination treatment for coronary heart disease cost 18.4 days wages in Malawi, 6.1 days wages in Nepal, 5.4 in Pakistan and 5.1 in Brazil; in Bangladesh the cost

was 1.6 days wages and in Sri Lanka it was 1.5 [8]. Although generic substitutes are available for most of the medicines to treat CVDs, the prescription of more expensive branded medicines is still prevalent among prescribers in many countries.

2. Medicines for treating diabetes

For many of the over 220 million people with diabetes mellitus worldwide, the cost of the basic oral treatment is unaffordable when compared to the yardstick of one day's wage. The lowest-priced generic combination treatment regime for diabetes cost over two days' wages most countries, reaching as much as eight days' wages in Ghana. Cost are even higher for branded products [3].

The situation is more critical for those needing insulin. Insulin is much less available and less affordable compared to the oral hypoglycemic medicines. Access to insulin remains poor in many regions of the world due to high prices, exposing patients to risk of serious complications and disease, such as blindness and amputation and death. Insulin prices in private pharmacies vary considerably between regions and between countries within the same region. A 10 ml vial of 100IU/ml soluble human insulin costs about US\$ 1.5 the Islamic Republic of Iran. It can cost more than US\$ 47 in the Congo and Namibia representing about 3000% price difference between these regions. Prices of insulin are higher in the African Region than in the Eastern Mediterranean and South East Asia. A "snap" (one-day) study conducted to measure the prices of insulin in private pharmacies in 60 low-income, medium-income and high income countries by Health Action International (HAI) in 2010, showed that the retail price of a medicine from a single company can vary considerably from one country to another. The price of insulin by a producer ranged from US\$ 9 in Zimbabwe to over US\$ 44 in Congo. Similarly, the price of insulin by another producer varies in price from US\$ 3 in Senegal to US\$ 47 in Namibia. It was shown that one company provides human insulin to the least developed countries (public and private sector) at prices that are 20% of the average prices in Europe, Japan and North America. In 9 of the 12 least developed countries where data was obtained, evidence indicates that insulin may be purchased at these low prices. However, the indications are that governments do not always

benefit from this low price offer or that the benefits of these reductions are not always transferred to the patients. In some countries, a family living on US\$ 1 a day would need to spend about half its monthly income to buy 1 vial of insulin from a private pharmacy. The cost of a one-month course of intermediate-acting insulin has been estimated to range from 2.8 days wages in Brazil to 19.6 in Malawi [8]. In some middle-income countries where family income could be as much as US\$ 2 a day for the majority of the population, a patient may need to spend one third to one half of monthly income to buy 1 vial of insulin from the two major companies supplying insulin internationally. The added cost of syringes, needles and glucose tests, further compounds the inaccessibility to insulin treatment for millions of diabetics who need insulin [19].

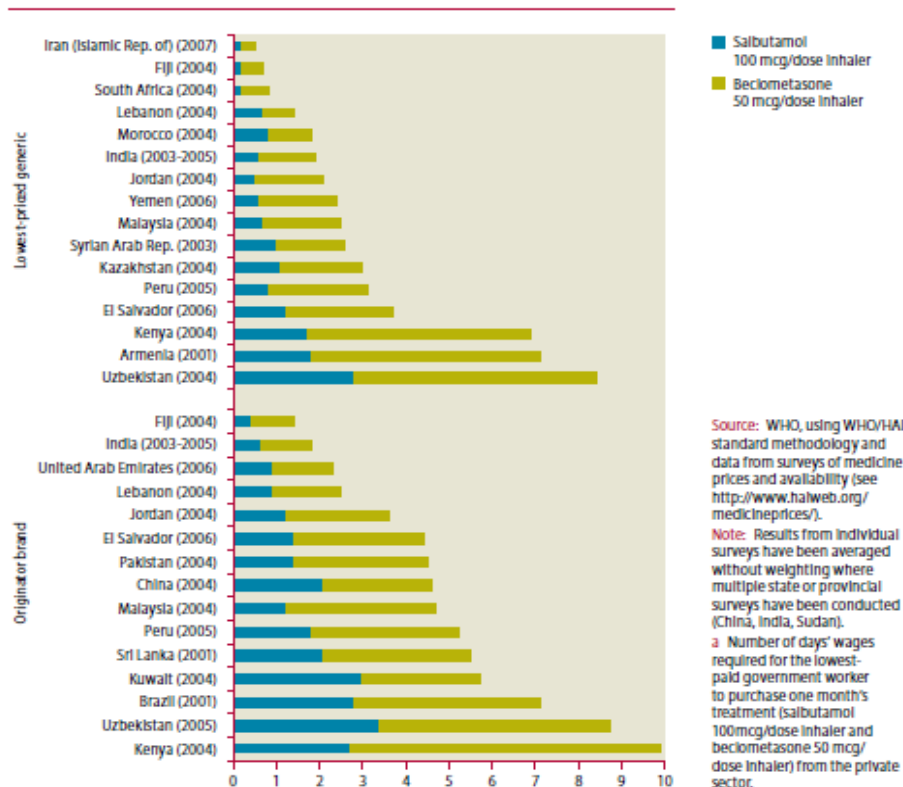
The availability and affordability of medicines is only a part of the factors responsible for poor accessibility of medicines needed to address a chronic condition as diabetes in many, especially low- and middle-income countries. Diagnostic tools, basic infrastructure and trained healthcare workers are also needed. Only 6% of health facilities surveyed in Mozambique had blood glucose testing strips in comparison to 25% in Zambia. These problems with supplies were combined with a paucity of trained healthcare workers [20].

The UN Millennium Development Goal 8 invites partnerships with pharmaceutical companies to provide access to affordable essential drugs in developing countries. In 2008 a differential pricing scheme was introduced by a company to supply of human insulin to the public health systems in the 49 Least Developed Countries (LDCs). The goal is to increase affordability and accessibility to insulin at prices not exceeding 20% of the average price in Europe, Japan and North America. By 2009, only 36 countries have accessed this facility to buy insulin at or below this price, compared to 32 in 2008 [21]. Notwithstanding the potential cost advantages of this scheme to patients in these countries, there are other barriers that prevent this lowered price from getting to the eventual users. These barriers emanate from inefficient distribution systems, middlemen and middle market activities in these countries and insufficient public budget for procurement of medicines.

Governments of some countries have not been able to benefit from this offer, either because of weak markets, or unfavorable business environments (from wars or political unrests). Reducing insulin prices on the private market, initiating discussions with local agents to reduce mark-ups, and working with governments to centralize insulin procurement are some of the strategies that have been proposed to circumvent these barriers. Some push back to this tiered price approach have however been identified. For example, middle-income countries have demanded lower prices of insulin similar to those that the poorest countries receive, and some poorer countries have been reported to use various discount rates to barter and spark competition among drug manufacturers [22].

3. Chronic respiratory diseases

As many as 300 million people live with asthma world wide and more than a quarter of a million die from asthma each year. Availability and access to inhaled steroids for treating sever cases of asthma remain poor in many countries. The annual cost of treatment asthma remains a barrier to access to treatment. This cost varies widely among countries. The cost of one month of combination treatment for asthma ranged from 1.3 days wages in Bangladesh to 9.2 days wages in Malawi [8]. In 2000, the minimum annual cost per case of moderate persistent asthma using standard treatment regimes was estimated to vary form US\$54 in Algeria to US\$ 288 in Sudan, to US\$650 in Kuwait. Using generic substitutes would have reduced these costs to US\$ 36. Studies have shown that one of the principal barriers to the implementation of standard asthma management in low-income countries is the high price of inhaled steroids. As a response to this barrier, the Asthma Drug Facility (ADF) was created to provide access to affordable good quality essential asthma drugs. The ADF uses pooled procurement and other purchasing and supply strategies to obtain affordable prices for quality assured essential asthma medicines. Ingrained in the ADF systems is a quality assurance process (based on WHO norms and standards) to ensure that quality is not compromised in the search for low prices. There are indications that the ADF has impacted a drop in the cost of treating asthma by nearly a half in Benin and El Salvador. This market model can be adapted for reducing cost of NCDs medicines in general (ref).

Affordability of treatment for asthma (days' worth of wages^a)

Source: World Medicines Situation report 2010

4. Access to medicines for treating cancers, palliative care

Of the 7.6 million deaths in 2005 due to cancer, three quarters were from the low- and middle-income countries where access to cytotoxic (chemotherapeutic) drugs and medicines for palliative treatment remains increasingly inaccessible.

i. *Chemotherapeutic medicines.*

A number of factors are responsible for the poor accessibility to cytotoxic drugs. Prices of cytotoxic medicines are mostly unaffordable even as they are being promoted inappropriately. Administration of these medicines requires specialist supervision and monitoring of untoward effects, supportive (ancillary) laboratory investigations and in some cases administration involves short time hospital stays for those that require slow intravenous administration. All of these factors add substantial cost of medicine to the

already high cost of medicines which are often required in two or more combinations for a full course of treatment. Availability of these classes of medicines is poor especially in the public sector in low- and middle-income countries. The efficient storage, supply and distribution systems that are necessary for maintaining access to these medicines are uncommon in many low-income countries. Evidence-based cancer treatment guidelines with strong consideration for cost-effectiveness of these expensive medicines are at present critical for the appropriate use of cytotoxic medicines in low- and middle income countries.

ii. *Controlled medicines for cancer pain and palliative care*

Moderate to severe levels of pain are often associated with most cancers and this pain can be controlled with opioid analgesics such as morphine, yet many factors contribute to the lack of access to controlled medicines. Access to many medicines that are under the international drug control treaties is lacking around the world, with the exception of a few industrialized countries (Figure 3). Even in some highly industrialized countries access to opioids to treat moderate to severe pain is limited. The World Health Organization (WHO) estimates that 5 billion people live in countries with no or insufficient access to treatment for moderate to severe pain (1). In these countries, each year around 5.5 million terminal cancer patients are suffering without adequate treatment. Most of them also do not have access to palliative care. Countries need to balance the obligations of ensuring the availability of these controlled medicines for medicinal purposes on the one hand, and to protect populations against abuse and dependence.

The WHO has developed an Access to Controlled Medications Programme (ACMP) in consultation with the International Narcotics Control Board which focuses on lifting barriers that impede access to controlled medicines. ACMP recently published the WHO policy guidelines and assists countries with the implementation of these

guidelines⁴. Furthermore, the ACMP assists countries in reviewing their national drug control policies and legislation in order to ensure that these substances are available for medical purposes and that population is protected against abuse and dependence.

5. Access to medicines for treating mental and neurological disorders.

Although mental and neurological disorders account for a significant proportion (about 14%) of the global burden of disease as mentioned above, only a minority of those suffering from these disorders receive basic treatment. This group of disorders includes depressive and affective disorders, schizophrenia, epilepsy, dementia, post- traumatic stress disorder, obsessive and compulsive disorders, panic disorder and primary insomnia [23]. A limited selection of “essential psychotropic medicines” has been recommended to meet priority mental health care needs in countries on the basis of their public health relevance, and evidence of their efficacy, safety and comparative cost-effectiveness. These medicines can be used for the treatment of symptoms of mental disorders, to shorten the course of many disorders, reduce disability and prevent relapse [24].

i. *Anti epileptics.*

Up to 80% of the 50 million people with epilepsy worldwide can lead normal lives if properly diagnosed and treated. Anti-epileptic medicines are the cost-effective public health interventions available for treatment of epilepsy. The first line antiepileptic medicines include carbamazepine, phenobarbital, phenytoin and valproate and the cost of treatment with phenobarbital could be as low as 5 USD per person per year. However, availability of these medicines remains poor in many countries. For instance, only 57% of pharmacies were found to have antiepileptic medicines in southern Vietnam [25]. Quality of antiepileptic medicines is also a problem. Only 35% of the tablets were correctly dosed in a study in Vietnam. Phenobarbital was

⁴ Ensuring Balance in National Policies on Controlled Substances: Guidance for Availability and Accessibility of Controlled Medicines and the WHO Guidelines on the Treatment of Persisting Pain in Children with Medical Illnesses.

found to be of poor quality in 14% of cases in Mauritania [26]. Almost half other the antiepileptic medicines from 111 pharmacy samples in Lusaka and Southern Provinces of Zambia did not carry anti-epileptic drugs (AEDs). Adult out-of-pocket monthly costs ranged from US \$7 to \$30. Pediatric syrups were universally unavailable. Newly enforced regulations may be further constraining the availability of antiepileptic medicines [27].

ii. Antidepressive medicines

Depression affects about 121 million people worldwide and can be reliably diagnosed and treated in primary care. But fewer than 10- 25 % of those affected have access to effective treatments. Antidepressant medications and brief, structured forms of psychotherapy are effective for 60-80 % of those affected and can be delivered in primary care [28].

Access to medicines for mental and neurological disorders is limited by the same factors responsible for the inaccessibility of all essential medicine in countries: poor selection, unaffordable prices, of medicines, inadequate financing, unavailability and inappropriate use of medicines. If unduly controlled as drugs, they are sometimes exposed to the same barriers that confront opioid analgesics. For example, barriers to anti-epileptics like phenobarbital can occur for this reason. In addition to addressing these factors, there is a need for strong mental health policies and strategies to achieve improved access. Mental health legislation also needs to be enhanced to improve access to excluded mental health medicines in many countries.

6. Medicines for treating tobacco dependence

Currently more than 1 billion people, one third of the world's adults, smoke tobacco [29] . Unless urgent action is taken, up to 1 billion people could die from smoking tobacco this century. Tobacco use is highly addictive and tobacco dependence is widely recognized as a chronic disease[30]. Nicotine replacement therapy (NRT) is one of the possible treatment methods to support smoking cessation. Two forms of NRT – chewing gums and transdermal patches – were

added to the 16th World Health Organization Model List of Essential Medicines in March 2009 on the recommendation of the 17th Expert Committee on the Selection and Use of Essential Medicines because of the public health need, high quality evidence of effectiveness, and acceptable safety and cost effectiveness [31]. Providing treatments including NRT to tobacco users has been identified as a "good buy" in reducing tobacco use and preventing NCDs [32]. Although NRT could not solely solve the tobacco problem, it has the potential to avoid more than 17 million tobacco related death [33].

NRT is generally available without prescription. According to WHO report on the Global Tobacco Epidemic 2009, 139 out of 186 countries sold NRT in pharmacies and/or in general stores [34]. However, smoker's affordable access to NRT is very limited. Few countries have included NRT on their National Essential Medicine Lists and only 29 countries reimbursed or insured NRT Partially or Fully [34] In comparison with cigarettes, NRT products are much more expensive, especially in Low and Middle Income countries. The accessibility and the affordability of NRT might be improved by listing this pharmaceutical product as an essential medicine on national lists, because the manufacture of generic brands of products that are now off patent might be stimulated, particularly in Low and Middle Income countries.

B. Policy and programmatic options for scaling up access to essential NCD Medicines in countries.

Clearly, in scaling up access to the treatment of NCDs, the quantities of the essential medicines will necessarily need to be increased. The cost implications for countries could be in tens of billions of dollars. For this reason alone, countries that already have some established policies to support access to NCDs would need to review existing policies to make them more efficient. Many policy options exist to address these inaccessibility problems and to achieve, for NCDs, the same three main objectives that are valid for any general essential medicines programme: equitable access (rational selection, affordable prices, sustainable financing and reliable systems); assured quality and safety; and cost-effective prescription and use of medicines. However, countries vary in their health systems

and in the levels of development of their pharmaceutical markets and systems. The options for scaling-up strategies must be specific to each country needs and best suit the local situation. A number of these policy options are highlighted in Box 1. Therefore, in most countries, the national medicines situation on the provision, supply and distribution of NCD medicines, will first need to be assessed to decide which approaches are most relevant to each country. Key elements to be considered would include:

1. *The rational selection of medicines*

Rational selection of a limited range of essential medicines and independently developed evidence-based clinical guidelines are essential for prevention and treatment of NCDs: These form the basis of the national programme of supply, reimbursement, quality assurance and quality use of NCD medicines. A core set of medicines that will be required for essential NCD interventions particularly in primary care as a minimum requirement, provides basis for improving access to NCD medicines in countries. For instance, to reduce cardiovascular risks in high risk patients, the use of thiazides, calcium channel blockers (CCB), ACE inhibitors, beta blockers (b-blockers) and statins have proven cost-effectiveness. Also aspirin, statins, CCB, b-blockers and thiazides as fixed dose combinations e.g. polypills are potentially cost-effective medicines to prevent recurrent attacks in those who already have suffered heart attacks and strokes. Similarly a core set of medicines and interventions for mental, neurological and substance use disorders have been specified in the Mental Health GAP Action Programme (mhGAP)⁵ intervention guide, which if adopted by countries, would lead to better health outcomes and cost savings [35].

2. *Adequate and equitable financing of the supply of essential NCD medicines*

Healthcare delivery systems of many developing countries are often poorly responsive to the treatment and control of chronic NCDs (and associated risk factors). Although WHO renewed efforts to support the enhancement and the development of countries' healthcare

systems will ultimately help to improve primary care systems worldwide, efforts to improve financial access to essential NCDs medicines are often lacking. Access to medicines and improvement of financial access are both encapsulated in the Millennium Development Goals (MDGs), providing a global framework for appropriating the synergies between health and economic access. In cooperation with pharmaceutical companies, MDG 8, E. target 17 seeks to provide access to affordable essential drugs in developing countries. This goal seeks to increase the population with access to affordable, essential medicines on a sustainable basis. As a part of the estimation done on behalf of the High Level Task Force on International Financing for the purpose of bridging the gap to achieving Health MDGs, in 2009, WHO estimated that international procurement of essential medicines to treat the major chronic diseases including mental and neurological disorders between 2009 and 2015 in the 49 least developed countries would cost about US\$4.7 billion. This translates to an average of \$ 0.65 per capita per year for the populations of these countries although estimates could double if allowance is made for local taxes and markups. There are a number of policy options with well established evidence base which are available to policy makers to manage and contain the prices of medicines to the ultimate consumers in countries.

Even if funds were available to increase the purchase of NCD medicines in these countries, individuals and household financial inaccessibility to these medicines continue to pose significant barrier to treatment. Other barriers exist such as weak supply and distribution systems, inefficient and inappropriate use of medicines and a lack of transparency in the supply and distribution chains. To respond adequately to the NCD medicines that will be required to adequately address the burden in these countries, increase in the volume and flow of the NCD medicines through the distribution systems should be anticipated. The present situation in many countries is that the unmet NCD medicines need is large and is likely to increase as the NCD burden continues to grow. Even a global marginal upscale of the access to these medicines has the potential to expand pharmaceutical production and markets. It is

⁵ WHO launched the Mental Health GAP Action Programme (mhGAP) in 2008 to scale up services and to reduce the service gap. The priority conditions covered by mhGAP include epilepsy, depression, psychosis, bipolar

anticipated that this market development may motivate private profit-making behaviours among the market actors some of which may ultimately mitigate the expected impact of global scaling up of access to NCD medicines. Global and national strategies to respond to anticipated market-related challenges to access to NCD medicines should be researched and developed even at this early stage.

3. Enhancing access to NCD medicines through affordable prices.

Affordable medicines can be promoted through various policies. These include: improved public procurement (although this is often not a problem); social marketing of generic essential medicines through the private sector; generic promotion policies (including preferential registration procedures, quality assurance of generic products, generic substitution, financial incentives and education of prescribers and consumers); separating the prescribing and dispensing functions; controlling the wholesale and retail mark-ups through regressive mark-up schemes; and exempting essential medicines from import tax and VAT (which can be classified as a tax on the sick). For patented medicines, several other options exist to promote affordability. These include: national clinical guidelines which recommend essential medicines for which generic products are available; therapeutic substitution; reimbursement measures (e.g. reference pricing); differential pricing; local production through voluntary licenses; and the flexibilities of international trade agreements to introduce generics while a patent is in force, such as government use and compulsory licenses for local production or importation.

4. Effective regulation is important for quality and safe use of medicines.

The quality and safety of medicines for NCDs require a functional national regulatory authority which is adequately resourced and staffed, and with legal powers to inspect facilities and products and to enforce the regulations. This also includes regulatory measures to encourage and enforce ethical promotion, and systems of post-marketing surveillance and pharmacovigilance.

disorder, alcohol and drug use disorders, self harm/suicide and child mental disorders including developmental and

5. *Evidence based clinical guidelines will enhance the appropriate use of NCD medicines*

Challenges remain with the development of evidence-based clinical guidelines for NCDs, including the area of diagnostic standards and when to start medical treatment. Especially in the area of NCDs, the international pharmaceutical industry is heavily engaged because of the long-term market potential of chronic treatments. For this reason the potential conflicts of interest between the industry, patient organizations, professional associations, health insurances and public sector organizations must be carefully identified and managed. This also applies to low- and middle-income countries where many locally produced "branded generics" are aggressively marketed for the treatment of NCDs.

The quality use of medicines by prescribers and consumers can be promoted by a large number of well-proven interventions, which include: a dedicated national body to monitor and promote quality medicine use; national essential medicines lists and formularies used for supply and training; evidence-based diagnostic and clinical guidelines; medicines and therapeutic committees in all major hospitals and districts; and financial (reimbursement or pricing) incentives linked to optimal prescribing practices.

While all of the above interventions should form part of any general national medicine policy and essential medicines programme, the enormous current and future disease burden in low- and middle income countries warrants a (temporary) separate and dedicated programme focused on essential medicines for NCDs within the scope of a national medicine policy. Much experience has already been gained with the long-term treatment of AIDS, and the further improvement of the treatment of the NCDs can be expanded in the future to include essential medicines for less frequent but debilitating chronic diseases such as epilepsy and schizophrenia.

6. *Repositioning the healthcare system*

behavioural disorders. [19].

To scale up access to essential NCD medicines, countries will need to reposition and improve their health systems by establishing clear strategies for financing and budgeting for medicines; improving and sustaining adequate pharmaceutical work force; harmonizing the supplies and distribution systems; and regulation. It is recognized that to improve access to appropriate treatment in many developing countries, strategies should be put in place for retraining of care deliver personnel in addition to task shifting strategies. A barrier to access to NCD treatment is the notion that NCD medicines must only be prescribed by highly skilled health care givers (doctors, specialists etc). Although, primary diagnosis and initiation of treatment require high skill care givers, these staff are not readily available in the healthcare systems of developing countries [36]. Continuing adequate treatment maintenance at the peripheral levels (through back referrals) can be a good strategy for sustaining adequate access to medicines. Referral systems are inadequate in many low- and middle income countries.

There are a number of system-related interventions. Although WHO is working with countries in partnership with global actors, to support countries in overcoming some of these barriers to access to medicines, interventions (especially in the developing countries) have largely excluded addressing barriers to essential NCD medicines.

The range of chronic NCDs is wide and needs to be prioritized for effective and efficient intervention as resources are constantly scarce. In 2005, WHO prioritized the targeting of specific NCDs such as cardiovascular (heart) diseases and stroke, diabetes mellitus, cancers, and chronic obstructive airway diseases, on the basis of their contribution to the global burden of diseases. These groups together are responsible for over 70% of chronic NCDs and are relatively preventable and controllable. WHO has been working to address many of the systems-related factors responsible for the high burden of NCDs in the developing countries. Some of the strategies so far include: guidelines for enhancing task-shifting from physician-only prescribing to facilitating patients care and by non-physician healthcare workers; treatment algorithms that build capacity to manage NCDs within low-resourced settings; and

few others. All these strategies have tended to target the improvement of access to care from the healthcare delivery (supply) system's perspective.

C. The global scene

At the global (international level), experiences from recent developments in improving access to essential medicines are available to inform the strategizing of global response to the poor access to medicines to treat NCDs. Some of these have been discussed above. The experience from medicines market modulating models (ADF, UNITAID etc) can be expanded to improve the affordability of other essential NCD medicines. International financing mechanisms have been successful in other disease areas and are potentially useful for improving access in poor countries. There are presently large numbers of donor collaborations to improve access to acute medicines and relatively little such collaboration is directed to the improvement of access to NCD medicines. International partners meetings to discuss the extension of collaboration to increase the access to NCD medicines are overdue. The emergence of a large group of global health initiatives (GHI) can provide opportunities for enhancing access to essential medicines for the treatment of NCDs [37]. Globally orchestrated efforts are required to mitigate the negative impacts of the ongoing economic downturn on access to NCD medicines in especially low- and middle- income countries. GHIs can catalyze these efforts.

D. Conclusions

Enhancing access to safe and affordable medicines is crucial for addressing the global burden of NCDs. Cost-effective medicines to treat NCDs are available mostly in low cost generic forms yet, they remain inaccessible and unaffordable to many who need them especially in low- and middle income countries where the prevalence of NCDs are increasing. Global and country level efforts are required to provide needed NCD medicines in the public sector at affordable prices and in the required quantities. Scaling up access to NCD medicines is critical to global efforts to ameliorate the burden of NCDs and also in achieving the health millennium development goals. However, challenges to scaling up access to NCD medicines remain in countries. Some of these challenges emanate from those that generally confront countries' health system and those that are to the peculiarities of NCDs and the medicines needed to treat them. These challenges to scaling up access to NCD medicines reflect each country's situation and must therefore be addressed in a country specific way to achieve sustainable equitable accessibility. This can be achieved by a combination of policies and programmatic options suited to countries' situation. Concerted global efforts are however important for improving access to NCD medicines and the emergence of NCD-GHIs could be a viable platform. Governments, in collaboration with the private sector, should give greater priority to treating chronic diseases and improving the accessibility of medicines to treat them. Important mechanisms for providing sustainable access to NCDs include the development and use of evidence based guidelines for the treatment of NCDs. efficient procurement and distribution of these medicines in countries, establishment or the provision of viable financing options and promoting the use of generic medicines.

References

1. Abegunde, D.O., et al., *The burden and costs of chronic diseases in low-income and middle-income countries*. Lancet, 2007. **370**(9603): p. 1929-38.
2. Abegunde, D.O. and A.E. Stanciole, *The economic impact of chronic diseases: how do households respond to shocks? Evidence from Russia*. Soc Sci Med, 2008. **66**(11): p. 2296-307.
3. *Strengthening the global partnership for development in a time of crisis*. MDG Gap Task Force report. 2009, New York: United Nations. xiii, 72 p.
4. World Health Organization. Dept. of Chronic Diseases and Health Promotion., *Preventing chronic diseases : a vital investment : WHO global report*. 2005, Geneva: World Health Organization. 182 p.
5. Kohn, R., et al., *The treatment gap in mental health care*. Bull World Health Organ, 2004. **82**(11): p. 858-66.
6. Meyer, A.C., et al., *Global disparities in the epilepsy treatment gap: a systematic review*. Bull World Health Organ, 2010. **88**(4): p. 260-6.
7. Cameron, A., et al., *Medicine prices, availability, and affordability in 36 developing and middle-income countries: a secondary analysis*. Lancet, 2009. **373**(9659): p. 240-9.
8. Mendis, S., et al., *The availability and affordability of selected essential medicines for chronic diseases in six low- and middle-income countries*. Bull World Health Organ, 2007. **85**(4): p. 279-88.

9. Gelders, S., et al., *Price, availability and affordability. An international comparison of chronic disease medicines*. 2006, World Health Organization Regional Office for the Eastern Mediterranean, Cairo.
10. UN. MDG Gap Task Force Report, *United Nations Millennium Development Goal 8 The Global Partnership for Development at a Critical Juncture* . 2010: New York. p. 57.
11. Kotwani, A., *Availability, price and affordability of asthma medicines in five Indian states*. *Int J Tuberc Lung Dis*, 2009. **13**(5): p. 574-9.
12. Higuchi, M. *Costs, availability and affordability of diabetes care in the Philippines*. 2009 [cited 2009 October 12]; Available from:
http://www.fasid.or.jp/chosa/jyosei/list_pdf/19-1-e.pdf.
13. Niens, L.M., et al., *Quantifying the impoverishing effects of purchasing medicines: a cross-country comparison of the affordability of medicines in the developing world*. *PLoS Med*, 2010. **7**(8).
14. World Health Organization., *The world health report: health systems financing: the path to universal coverage*. 2010, Geneva: World Health Organization. xxii, 106 p.
15. Twagirumukiza, M., et al., *Influence of tropical climate conditions on the quality of antihypertensive drugs from Rwandan pharmacies*. *Am J Trop Med Hyg*, 2009. **81**(5): p. 776-81.
16. U.S. Food and Drug Administration. *FDA Warns Consumers about Counterfeit Drugs from Multiple Internet Sellers*. 2007 18 June 2009 [cited 2011 1 March 2011]; Available from:
<http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/2007/ucm108904.htm>.

17. Ministry of Health and Social Welfare, T., *Assessment of the Pharmaceutical Human Resources in Tanzania and The Strategic Framework, 2009*. 2010, Ministry of Health and Social Welfare, Tanzania: Dar es Salaam.
18. Pharmacy Council , M.o.H., Ghana., *Assessment of Human Resources for Pharmaceutical Services in Ghana*. 2009, Pharmacy Council , Ministry of Health, Ghana
19. WHO EMRO. [cited 2011 January]; Available from:
<http://www.emro.who.int/pressreleases/2010/no13.htm>.
20. Beran, D. and J.S. Yudkin, *Diabetes care in sub-Saharan Africa*. Lancet, 2006. **368**(9548): p. 1689-95.
21. IFPMA. *Novo Nordisk: Differential Pricing on Insulin*. [cited 2011 1 March 2011]; Available from: <http://www.ifpma.org/index.php?id=3789>.
22. Bate. R. *Drug Pricing and Its Discontents*. AEI 2007 [cited 2011 January]; Available from: www.aei.org/outlook/26622.
23. *The World health report : 2001 : Mental health : new understanding, new hope*. 2001, Geneva: World Health Organization. 178 p.
24. World Health Organization. Dept. of Mental Health and Substance Dependence., *Improving access and use of psychotropic medicines*. Mental health policy and service guidance package. 2005, Geneva: World Health Organization. 57 p.
25. Mac, T.L., et al., *AEDs availability and professional practices in delivery outlets in a city center in southern Vietnam*. *Epilepsia*, 2006. **47**(2): p. 330-4.
26. Laroche, M.L., et al., *Quality of phenobarbital solid-dosage forms in the urban community of Nouakchott (Mauritania)*. *Epilepsia*, 2005. **46**(8): p. 1293-6.

27. Chomba, E.N., et al., *The current availability of antiepileptic drugs in Zambia: implications for the ILAE/WHO "out of the shadows" campaign*. *Am J Trop Med Hyg*, 2010. **83**(3): p. 571-4.
28. World Health Organization. *Mental Health Depression*. [cited 2011 09 March 2011]; Available from:
http://www.who.int/mental_health/management/depression/definition/en/index.html.
29. World Health Organization, *WHO report on the global tobacco epidemic, 2008. The MPOWER package*. 2008, World Health Organization: Geneva.
30. World Health Organization, *International statistical classification of diseases and related health problems, tenth revision (ICD-10)*. 2007, World Health Organization: Geneva.
31. World Health Organization. *The 16th World Health Organization Model List of Essential Medicines*. [cited 2011 9 May 2011]; Available from:
http://www.who.int/selection_medicines/committees/expert/17/sixteenth_adult_list_en.pdf.
32. World Health Organization. *Global status report on noncommunicable diseases*. [cited 2010 9 May 2011]; Available from:
http://www.who.int/nmh/publications/ncd_report_chapter4.pdf.
33. Jha P, e.a., *Tobacco addiction, in Disease control priorities in developing countries*. 2006, Oxford University Press: New York.
34. World Health Organization, *WHO report on the global tobacco epidemic, 2009: implementing smoke-free environments*. . 2009, World Health Organization: Geneva.
35. Chisholm, D., *Cost-effectiveness of first-line antiepileptic drug treatments in the developing world: a population-level analysis*. *Epilepsia*, 2005. **46**(5): p. 751-9.

36. Abegunde, D.O., et al., *Can non-physician health-care workers assess and manage cardiovascular risk in primary care?* Bull World Health Organ, 2007. **85**(6): p. 432-40.
37. Samb, B., et al., *An assessment of interactions between global health initiatives and country health systems.* Lancet, 2009. **373**(9681): p. 2137-69.