CHAPTER II
LITERATURE REVIEW

2.1. WHO\HAI standard methodology

Despite of the facts that prices of medicines have an impact on the affordability of drugs and ultimately on access to essential medicines, little is known about the prices paid by patients for essential medicines in low and middle income countries.

In May 2003, WHO in collaboration with Health Action International (HAI) published a manual, "Medicines Prices a New Approach to Measurement". The standard methodology describe precisely data collection on availability prices and affordability, from public, private or other sectors, for selected list of essential medicines, the survey on this methodology can be at states or country level, and allow assess prices and prices components of the medicine.(WHO/HAI, 2008b)

This methodology was validated for the possibility of bias due to limited target list and geographical sampling, no significance difference in overall availability and price of target list medicines by retail location (Madden et al., 2010). Madden concluded that WHO/HAI survey approach has suitable balance between modest research cost and optimal information for policy.

An study done on 2010 on the differences in the availability of medicines for chronic and acute conditions in the public and private sectors of developing countries used secondary data for fifty surveys conducted in forty developing countries using the WHO/HAI standard methodology the name of the countries and date of survey found in annex 2 tells that this standard methodology has done far to give clue comparisons between different countries. (A Cameron et al., 2011)

2.2. Medicine prices

Dissemination of completed surveys of medicine prices and availability conducted according to the standardized WHO/HAI methodology, throughout WHO regions, during the period 2001–2008 is shown on the table II-1 below, In India the 1st survey done using the same standard methods was in Rajasthan state in (Kotwani, Ewen, & Laing, 2006) Kowari found that the local government medicine procurement

prices was efficient, for people who took their medicines from public the retail prices was relevant, although the availability was very low, people have to get their medicines from the private where half of the medicines surveyed is twice the international reference prices, and the price of medicines like Albendazole, Diclofenac and diazepam.were very high.

Table 2. 1 Surveys completed using WHO/HAI methodology 2001-2008

WHO region	Number of participating countries	Number of completed surveys
Afro region	11	11
The Americas	6	6
South- East Asia	4	10
Europe	6	6
Eastern Mediterranean Region	11	14
Western Pacific Region	5	6

Source: (Cameron A., Martin Auton, Dele Abegunde, 2011)

High medicine price affect all, countries, disease burden and all people, but the greatest price is paid by those who suffer from chronic non-communicable disease (NCD) those who are forced to pay out of their pockets. A global short survey done in May 2010 using standard WHO/HAI methodology for the price of 10ml vial human soluble insulin across 60 countries showed is very high in price when purchased from private medicines outlets, the prices vary between $1.55 (Iran) to $76.69 (Austria), the difference reached to 5000%, while the average international price of neutral human insulin was about $20. In some counties like Congo the price of one 10ml vial was $47.60, Indonesia $ 44.68, Costa Rica $51.21 and Palestine $42.67 per a vial which is really unaffordable to many people in low and middle income countries. In Nigeria Insulin was unavailable in one of the state "Insulin is a strategic medicine which is shamefully unavailable, we have states where there is no insulin available" one of policy makers comment (HAI, 2010)

2.2.1. The price components of medicine

The price component vary among countries, among different sectors and even among the medicines which may be exempted from government fees (e.g. live saving essential medicines), while public sector may be exempted from certain taxes and tariff, but there are some prices components commonly found in medicine price in

different country settings eg. Manufacturer Sale Price, port and inspection fees, Insurance and Freight, pharmaceutical import fees, importer profit, value added tax, good and services tax and prescribing charge.

These components have their affect supply chain, which can be divided in to five stages that medicines go through as they moving from manufacture to the patient, although the components of each stage vary from one country to another. In stage one manufacture sale price in addition to insurance and freight, but for locally produced medicines this stage is only the 1st component will be considered.

The second stage known as landed price, this compose of all components arise during medicines procurement and delivery to procurement office (e.g. bank charge rate for foreign currency purchase, charge for inspection, port duties that includes 'handling , docking, storage, insurance in port', customer clearing, import tariff and importer's profit. All centrally collected fees should be listed here.

Other charge including transportations to central storage, not domestic warehouse and distribution cost. While in the third stage "whole sale price" it based on landed price in addition to warehouse expenses or central storage administrative cost e.g. check quality, storage, transporting, and administrative costs. On stage four, the retail medicine outlets sale price is based on the whole sale price and includes the additional expenses e.g. storage, rent, salaries, and retailer profit. The last stage is stage five "Dispensed price" it includes stage 4 plus any dispensing charge and any sale taxes (WHO/HAI, 2008a)

Medicine mark-up in private pharmacy in Khartoum reached up to 94%, this includes government import fees, in other states the margin of profit is higher; mark-up exec that limit (G. Ali & Y. Yahia, 2012).

2.2.2. Pricing policies

Price regulation is considered as a vital element of government pharmaceutical policy; in developed country settings it can take different forms. Many approaches exist like free market pricing, international reference depend pricing, pricing compare to a substitute, price selling, profit margin controls (Espin, Rovira, & Labry, 2011).

In these settings, countries have well developed systems of health insurance including some level of coverage for drug expenditures. Furthermore, high-income countries have sufficient regulatory and enforcement capacity.

In the other hand pricing policies in low and middle-income countries are less developed. For example, few employ pricing policies such as external reference pricing (Espin et al., 2011). In these settings, there are very weak public regulatory authorities, and weak relationships with regulatory bodies, the police and judiciary; that leading to , ignorance of official prices from whole seller and dispenser (Seiter, 2010).

The outcomes of good price regulation in developed countries is more affordable medicine prices to patients (Gelders, Ewen, Noguchi, & Laing, 2005). Findings from a recent systematic comparative cross-section survey of selected medicines across low and middle-income countries conclude that there were wide variation in prices between brand medicines and generic one (WHO/HAI 2006).

Price regulation and enforcement assist to control big variation in medicines prices, moreover, that study revealed policies related to taxes tariff fees, affect access and affordability, can be improve by lowering tariffs, duties and taxes, in addition less expensive prices supplied by international organizations. (Cameron, Ewen, Ross, et al., 2009).

Furthermore, policy solutions should consider the local context as there can be wide differences within countries. For instance in Mozambique, local mark-ups are responsible for two-thirds of drug's final prices in private pharmacies; statutory and profit ceilings are applied unevenly; the local market responds effectively to the urban population's diverse needs through its low-cost and high-cost segments

The public authority's ability to negotiate with the pharmaceutical industry will affect the prices at which the authority procures medicines for its population. For example, some countries that procure well based on this survey are Jordan, Lebanon, Peru, Tunisia, and Uganda.

Apart from surveys using WHO/HAI methodology shows that LMICs faces difficulties to enforce in effectively enforcing statutory mark-up regulation (see Table 2-2) (Ball, 2011)

Table 2. 2 Enforcement of pharmaceutical mark-up regulations in LMIC

Country	Comment
Chad	Official mark-ups in the public sector not respected
Costa Rica	There is difficulties to control and monitor price margin and mark-up
Ghana	Few public facilities followed government regulations , poor awareness of regulations
India	Small differences between official and actual retail prices
Kosovo	regulated mark-up of 15% of retail prices nor respected
Mozambique	there is regulated mark-up policy, but not implemented
Nepal	Distributers were aware of regulated mark-ups but usually applied higher mark-ups
Pakistan	3 of each 20 originator brand medicines had prices 17 – 50% higher than the regulated price
Russia	Ineffective enforcement of wholesale and retail mark-ups noted
Yemen	Actual prices found to deviate significantly from those predicted with official mark-ups

Source: HAI/ Medicine Prices and Availability, the regulation of mark-up in the pharmaceutical supply chain, 2010

At the same time the percentages cumulative mark-up differ in different low and middle income countries, (see table 2.2 below) (A Cameron, 2008).

In generic medicines pricing regulations in different countries where the policy vary within these countries e.g. in Belgium the generic medicines should be priced less than 30% and 40%, while in Denmark for reimbursement purposes, generic medicines need to be priced below the price level of originator one, but in Finland where free medicine pricing is stated, although a maximum wholesale price is fixed and serves as a basis for reimbursement, in country like India companies are free to set generic medicine prices, but essential medicines listed in NEML are price-controlled.

In United Kingdom pharmaceutical companies are free to set prices of generic medicines. However, the Department of Health cannot allow market failure if free price policy can lead to that (Simoens, 2007). But still new innovations in pharmaceutical market is necessary to develop the pharmaceutical sector, once a patented medicine enters the market, the manufacturer has some degree of monopoly power, the ability to set the product's price appreciably above the current production manufacturing expenses without perceive dramatic losses in sales.

Few product medicines not have alternative substitutes in the market. What matters most is that, the medicines are differentiated substantially from their substitutes; the producer can then make a trade-off between volume and price, differentiation happens as various chemicals targeted to specific disease have diverse therapeutic effects and contraindications.(Scherer, 2004)

Table 2. 3 Mark-up in Public &Private in LMICs

Country	% mark-up in public sector	T% mark-up in private sector
China	24-35%	11-33%
El Salvador		165-6894%
Ethiopia	79-83%	76-148%
India		29 -694%
Malaysia	19-46%	65-149%
Mali	77-84%	87-118%
Magnolia	32%	68-98%
Morocco		53-93%
Uganda		30-66% 100-358%
Pakistan		28 – 35%

Source: (Alexandra Cameron a, 2008)

Depend on the country pricing policy that country employ, cumulative percentage mark-up then will the final result of any underestimation on that particular policy and it is impact on affordability.

In 2003 Norwegian government implemented new price regulation on a selected medicines experiencing generic competition. The retail price cap, called "index price", on a medicine was adjusted same to mean of three lowest producer prices on that medicines, in addition to a fixed wholesale and retail profit. This new policy aim to promote generics price competition and that policy helped to increase the market shares of generic drugs and succeeded in triggering price competition (Dalen, 2006)

But free market policy cannot control medicines price this evidence shown by (Z. U. D. Babar, Ibrahim, Singh, Bukahri, & Creese, 2007), study done in Malaysia where they show that the medicine cost and price is keep increasing in the country despite the free market competition, concluding that some extend of regulations is required in pharmaceutical market to be efficient.

2.2.3. Reference pricing

According to Economic Co-operation and Development Organization (OECD) external reference price (ERP) benchmarking, defined as "the practice of comparing pharmaceutical prices across countries" and it is so far indicated that "there are various methods applied and different country baskets used". This definition was adjusted by European-funded project Pharmaceutical Pricing and Reimbursement Information. The rationale behind reference price is aim to impose price cap, to bring purchaser and regulatory authorities to price bench-mark. But that definition is

adjusted to "The practice of using the price(s) of pharmaceutical product in one or several countries in order to derive a benchmark or reference or reference price for the purpose of setting or negotiating the price of the product in a given country"(Espin et al., 2011). However MSH reference price not always lower, (Russo, 2010) shows that the retail prices for generics were cheaper than the MSH reference price in public urban retail pharmacies in Mozambique.

Medicine prices are expressed in form of ratios relative to standard set of reference prices ease comparison between national and international prices, these international reference prices (IRP) are recent purchasing prices given by not-for-profit and for-profit agencies to develop more than one source product. And IRP is commonly of high significance when there is lots of supplier quoting for each medicine. That is why it is important to be sure that all surveyed medicines have IRP to make the comparison later on. There also other source of IRP like New Zealand Pharmaceutical Management Agency prices[4] and Australian Pharmaceutical Benefits Scheme prices[5] (WHO/HAI, 2008c)[6]

Drew backs in international comparisons when taking MPR in two or more different countries to compare the interpretation of the result can be rather difficult as the medicines market volumes in these countries may differ, some surveys may conducted in different years with countries subject to diverse inflation rate and having different retail buying power of the local exchange rate, adjustment the data for inflation and PPP is highly recommended (WHO/HAI, 2008c)

2.2.4. Lowest generic price and quality

The lowest generic price is most likely preferable because it contribute to essential medicines availability and affordability, an study done in 2011 focusing on 8 items approved by WHO, 899 sample items were analyzed from 17 low and middle income countries, they found that 15% of these medicines failed to pass at least one test, these items which failed to pass their price were 13.6% - 18.7% lower than the good items (Bate, Jin, & Mathur, 2011). Meaning that lowest price generics not

[4] http://wwwpharmac.govt.nz
[5] http//www.pbs.gov.au/html/healthpro/home
[6] http://www.who.int/medicines/areas/access/medicines_prices08/en/

always the best answer to essential medicine affordability, quality facter should be considered when formulating pricing policies.

2.3. Medicines Availability

Availability(physical availability) in general include the logistic process of making list, ordering, shipping, storing, distributing and delivering of health technology to the final user (Frost & Reich, 2008).

The availability is defined as, the percentage of medicine outlets in which the medicine was found on the day of data collection.(Cameron, Ewen, Auton, & Dele 2011). Availability then considered as especial component in having access to essential medicines, it is important for achieving the health-related MDGs and attending to the health needs of developing countries. However, essential medicines are available in only 42 % of facilities in the public sector compared to 64%in the private sector. In spite of poor availability, the scarce of national regulatory capacity to ensure and enforce quality remains a problem in many countries, and thus populations remain victims of poor quality medicines.

The availability of non-communicable diseases medicines is even lower than that of communicable diseases. This is also a growing concern in low-income countries, where the burden of these diseases is rapidly increasing.(UN, 2012)

Study of 30 essential medicines for communicable and non-communicable disease in 40 low and middle income countries shows that the generic medicines for non-communicable disease is less available than those generic of communicable disease in both public and private sector, in the public sector the availability was (36% versus 53.5%) while (54.7% versus 66.2%) in the private sector (A. Cameron, A. Ewen, et al., 2011) Medicines availability usually varies between public sector and private sector,

The availability of EM in the private sector is usually higher than public e.g survey conducted in Guatemala in 2010 revealed that the availability of selected EM in the public sector is only 25%, while it was 35% for the private (Anson, Ramay, de Esparza, & Bero, 2012).

Other studies shows that availability of acute and chronic disease medicines (generic) in 40 developing countries it was 36% for chronic and versus 53.5% of

acute disease medicines in the public, while in the private sector it was 54.7% for the chronic disease medicines versus 66.2% for the acute disease medicines(A, M, Ross-Degnan, Ball, & Laing, 2009).

In rural area in China suffer the same problem of availability and accessibility and patients will not reimburse when he buys the medicines from the private retail medicine outlets (Yang, Dib, Zhu, Qi, & Zhang, 2010).

To maintain stable medicine supply in the public sector in low and middle income countries it is rather difficult, e.g. in Nigeria where stock-out is the public sector is common problem (O'Connell et al., 2011).

There are some improvement in the availability of medicines using number of interventions in developing countries such as privatization of the distribution system, user fees system, revolving drug funds, disease-drug specific programs, organized supervisory visit programs, continuous training and educations, community based intervention, (Nunan & Duke, 2011). However evidence from Malaysia show the effect of privatization on prices but that not related so much to intervention of privatization rather to the pricing policy of the country (Z. D. Babar & Izham, 2009), Babar and Izham proof that privatization is not the correct answer to improve supply system.

In 2009 a survey conducted in five regions in India to assess the availability, prices and affordability of Beclometasone and Salbutamol inhalers, it found that the essential inhalation medicines for asthma were not available in the public sector where poor patients get their medicines, and the essential inhalation medicines for asthma were not affordable for the majority of the population (Kotwani, 2009).

Table 2. 4 Average Availability in 36 LMICs

WHO region	AFR	AMR	EMR	EUR	SEAR	WPR	All	
No of surveys	n=8	n=2	n=11	n=2	n=8	n=5	n=36	
Basket of 15 medicines	**29.4**	**54.4**	**39.6**	**40.5**	**38.3**	**43.0**	**38.4**	**Public**
	20.3-41.2	52.7-56	9.7-60.4	32.1-57.9	16.3-57.9	22.2-79.2	9.7-79.2	
	54.6	**68.8**	**68.9**	**66.9**	**75.1**	**50.1**	**64.2**	**Private**
	14.8-79	66.6-70.6	36.3-97.5	61.4-70.9	64.3-91.8	33.6-77.6	14.8 -97.5	
Ciprofloxacin 500mg	**50.4**	**94.2**	**49.3**	**42.5**	**62.8**	**24.5**	**52**	**Public**
	4.2-82.1	92.3-96.2	0.0-100	0.0-85.0	0.0-100	0.0-75	0.0-100	
	79.3	**97.6**	**92.3**	**82.7**	**92.8**	**57.3**	**82.4**	**Private**
	27.3-96	96.2-99	66.7-100	43.3-97.5	68.6-100	0.0-97.2	0.0-100	

Source: (Cameron, Ewen, Ross-Degnan, Ball, & Laing, 2009)

Table 2.4 above summarize the availability of 15 basket of essential medicines taken from 36 LMICs survey conducted before using WHO/HAI standard methodology and give clue that the availability of basket of the this 15 medicines is usually low in the public when compared with the private sectors, although there is a variation in WHO regions according to economic status of the countries in each specific group.

2.4. Medicines Affordability

2.4.1. Measuring affordability

Two approaches are generally used to estimate affordability. One relies on the ratio of expenditures to household resources, while the second approach focuses on the residual income after expenditure. In the first approach, the payment for a good is considered as catastrophic when it exceeds a certain proportion of a household's resources. For the second or "impoverishment" method considers the absolute available resources before and after payment for a commodity. If the household is initially above the poverty line but go below it after paying for the commodity, it can be said to have been "impoverished" by the payment.(LM Niëns et al., 2012)

The lowest paid unskilled government worker in the Democratic Republic of Congo has to work for 24 days to pay for one month's supply of two lowest priced generics for hypertension treatment (Captopril 25mg tablets) and diabetes (Metformin 500 mg tablets). The cost of originator brands even higher than generics, and buying the medicines from the public sector at a lower price is remote areas as the availability is only about 5%. This problem can be found in many other countries those same generic medicines are also unaffordable; about 6 days wages are needed each month to purchase the medicines in El Salvador, 4 days in Brazil (Rio Grande do Sul State), and about 3 days in Yemen and Mexico City (Bertoldi, Helfer, Camargo, Tavares, & Kanavos, 2012)

Till the end of 2007, more than 50 surveys had been conducted in LMICs, the results of these surveys revealed suitable clues shown for the first time, part of these facts are that in many LMICs medicines prices are high especially in the private sectors, while availability is low in the public sector and treatment is usually

unaffordable (WHO/HAI, 2008b) the table 2.5 below illustrate the availability and affordability of Salbutamol inhaler 0.1mg/dose in selected LMICs, gives evidence of very high price for salbutamol inhaler in the private sectors while it is less available in the public sector, so patients has to pay very high prices to get it. In Uganda for example patient has to pay 8 day's wage to get the treatment of originator Salbutamol inhaler while only 4.6 day's wage for lowest priced generic.

Table 2. 5 Availability, Affordability of Salbutamol inhaler in LMICs

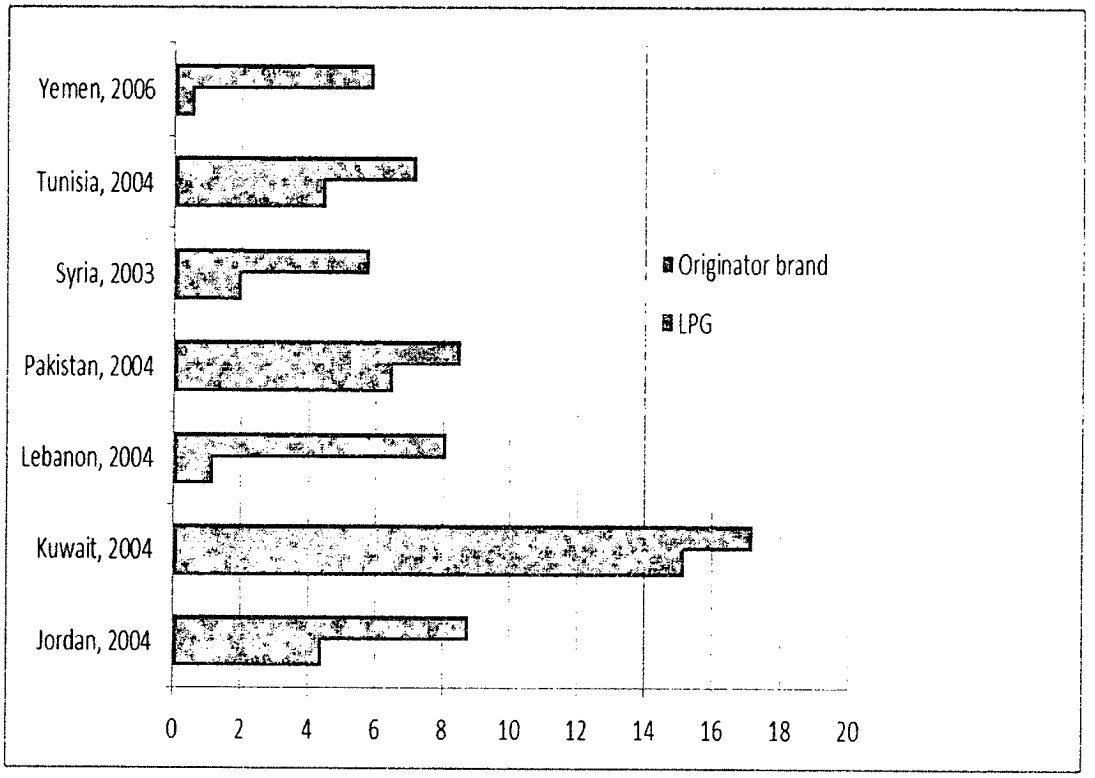
	Availability in Public sector		Affordability – private sector	
	Originator	LPG	Originator	LPG
Uganda, April 2004	0%	0%	5.6 days	2.0days
Ghana Oct 2004	4%	11%	8.0 days	4.6 days
Mali, March 2004	0%	0%	4.2 days	2.7 days
Pakistan, July 2004	0%	3%	1.4 days	1.4 days
Indonesia Aug 2004	13%	0%	4.1 days	-

Source: (WHO/HAI, 2008b)

2.4.2. Comparisons of the affordability of treatment

International comparisons of affordability can be made by transfer the data on the number of day's wages required to pay for course of treatment (affordability analysis) to a cross-country comparison chart (see figure 2.1 below) it shows peptic ulcer treatment with Ranitidine 150mg tablets purchased from retail pharmacy in Kuwait would cost 12 days of income for a person on the lowest government wage, while the same treatment course in other countries would be 6 -8 days' wages for the originator brand and 1-6 days' wages for the lowest-price generic, but in country context you find that in Kuwait for examples all citizens are covered by health insurance(WHO/HAI, 2008d). The figure II-1 shows the result of affordability in seven countries for patient to buy Ranitidine 150mg for one month

Figure 2. 1 Inter-country comparison of affordability 30 days Ranitidine



Source: WHO/HAI, 2008

Table 2.6 summarize the affordability of 36 countries in low and middle income derived from(Cameron, Ewen, Ross, et al., 2009) shows the day's wage needed to buy treatment of diabetes, adult RTI and asthma with the standard treatment course using day wage for lower wage unskilled government worker, explain the variations between WHO regions and how it vary between private and public sectors. Generally the treatment in the public sector is more affordable than private.

Table 2. 6 Mean number of day's wages of the LPUGW

		AFR	AMR	EMR	ERO	SEAR	WPR
Adult respiratory infection; *amoxicillin* 250 mg capsule/tablet, three per day for 7 days							
Private sector	OB	2 · 9 (n=6)	1 · 9 (n=1)	1 · 6 (n=5)	1 · 4 (n=1)	1 · 2 (n=4)	0 · 5 (n=2)
Private sector	LPG	0 · 5 (n=6)	1 · 0 (n=2)	0 · 6 (n=8)	2 · 9 (n=5)	0 · 6 (n=8)	0 · 4 (n=4)
Public sector	LPG	0 · 5 (n=6)	0 · 2 (n=1)	0 · 3 (n=4)	7 · 9 (n=1)	0 · 4 (n=1)	0 · 4 (n=3)
Diabetes; *Glibenclamide* 5mg capsule/tablet, two per day for 30 days*							
Private sector	OB	8 · 4 (n=7)	4 · 5 (n=1)	2 · 1 (n=8)	0 · 5 (n=1)	1 · 3 (n=8)	1 · 6 (n=3)
Private sector	LPG	1 · 8 (n=7)	1 · 5 (n=2)	0 · 9 (n=12)	1 · 8 (n=4)	0 · 4 (n=8)	0 · 7 (n=4)
Public sector	LPG	1 · 1 (n=7)	0 · 1 (n=1)	0 · 5 (n=4)	2 · 5 (n=2)	0 · 6 (n=1)	0 · 7 (n=1)
Asthma; *salbutamol* 0·1 mg/dose inhaler, 200 doses							
Private sector	OB	4 · 4 (n=8)	2 · 0 (n=3)	1 · 6 (n=11)	3 · 6 (n=4)	1 · 2 (n=9)	1 · 4 (n=5)
Private sector	LPG	2 · 5 (n=6)	1 · 0 (n=2)	0 · 8 (n=10)	5 · 0 (n=5)	0 · 6 (n=7)	0 · 7 (n=6)
Public sector	LPG	1 · 6 (n=2)	0 · 6 (n=1)	0 · 7 (n=3)	15 · 0 (n=1)		1 · 1 (n=2)

Source: (A et al., 2009)

2.4.3. Pay-for– delay

Brand-name pharmaceutical companies can delay generic competition that lowers prices by agreeing to pay a generic competitor to keep its competing medicine off the market for a period of time, so called "pay-for-delay" , these types of agreements have grown up as part of patent litigation settlement agreements between originator and generic pharmaceutical companies.

These agreements are "win-win" for the companies: because the brand medicine price will stand high, and the brand named pharmaceutical companies and the generics will share the profit. The loser will be then; the consumers, they miss out on generic prices that can be as much as 80 percent lower than brand named prices, for example, brand name medicine that costs $300 per month might cost as a generic product for the same medicine little as $30 per month.(Commission, 2010)

2.4.4. Generic Brand Paradox and Competition policy

The promotion of generic substitutions among the policy makers and public as well as professionals, who should give more confidence to generics use, is more important now to save many resources for more access, and the need for inclusion generic promotion in national pharmaceutical policies (Cameron, Mantel-Teeuwisse, Leufkens, & Laing, 2012)

The prices differences between brand and generics medicines can be shown from market entry due to patent loss, that can be explained by market share medicines, the number and age of both brand and generic in specific market, the prices of the brand medicines could go up while for the generic go down, therefore, the price, the ratio between bran and generic, is negatively related to the number of generic medicines in the market (Kong, 2004).

Recent study shows that utilization of brand medicines go down in the two years before the generic entry and that will continue to the years following generic entry, despite decreases in prices given by generic substitute of a medicine. This reduction coincides with the market entry and increased utilization of branded medicine reformulations (Huckfeldt, 2011). However it has been argued that the impact of generic substitution has been significant; average price of substitutable drugs has decreased more than 10 %. However, price development has been very uneven, some of the prices have gone up and some were decreased more than 50 %.

The biggest factors affecting price development was the number of the competitors, basic position of the medicine and width of the price pipeline. (Aalto-Setala, 2008).

It has been discussed that trademarks for medicine names reduce search costs but at the same time increase product differentiation. In this special design, trademarks may not mean any benefit to consumers. In the other hand, the generic names of drugs or ''International Nonproprietary Names'' have unquestionable benefits in both economic theory and empirical studies. However advertising of brand medicines creates generic name recognition. The monopoly product producer will advertise less than the other competitors.(Feldman & Lobo, 2012)

2.5. Pharmaceutical Market Behavior is Sudan

In 2006, medicines prices survey was done in Khartoum states to see the adherence of the whole seller and retailer to the price regulations stated by the NMPB, in that survey they calculate hypothetically the Whole sale Price (WP) and Retail Prices (RP), calculated by adding up government fees and profit % allowed by the regulations. They found that the WP and RP should be 1.5 and 1.8 from C&F price what is known as Marginal Price Ratio(MPR) which is equal to (WP/C&F),(RP/C&F), unfortunately only 14 out of 105 importing companies comply, but for the RP more than 47% of selected medicines was lower, also on that report international comparison was done and The C&F price of more than one-fifth of the studied items was more than 10 times the International Reference Price (IRP); 17 out of 24 of these items were generics. The C&F prices of certain medicines were extraordinary high, up to 100 times the International Reference Price (IRP).(G. K. Ali & Y. Yahia, 2012)

2.6. Pharmaceutical Industry

A key policy challenge for all countries is to balance industrial policy goals with health policy goals. There are a number of issues related to the pharmaceutical industry including intellectual property rights, pricing of medicines, competition in pharmaceutical markets, R&D particularly in areas of neglected disease that afflict developing countries and unethical practices of advertising and direct advertising to patients. This section focuses on the monopoly element of the pharmaceutical sector and implications for pricing policies that are relevant to the analysis in this thesis.

Intellectual property rights are afforded to firms through the use of patents according to the World Trade Organization's legal framework found in the agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) (WTO 1994). This policy provides the legal framework for all countries that are part of the agreement to recognize patented pharmaceutical products. This has implications for pricing of medicines because the firm has a monopoly on the drug and in principle could set its price freely in a country's market. In developing countries, the implication is that high priced medicines would undermine access for patients. One proposed policy response is differential pricing (also referred to as Ramsey pricing or price discrimination). This policy means that pharmaceutical firms sell the same medicine to developing countries at different prices that reflect a country's price elasticity of demand (WTO and WHO 2001).

Medicine market should be controlled by the government, because free market of medicines because whatever reduction on the price without controlling markup may increase the profit for dispenser without benefit to the end user (Z. U. Babar, Izham, Singh, Bukahri, & Creese, 2007)

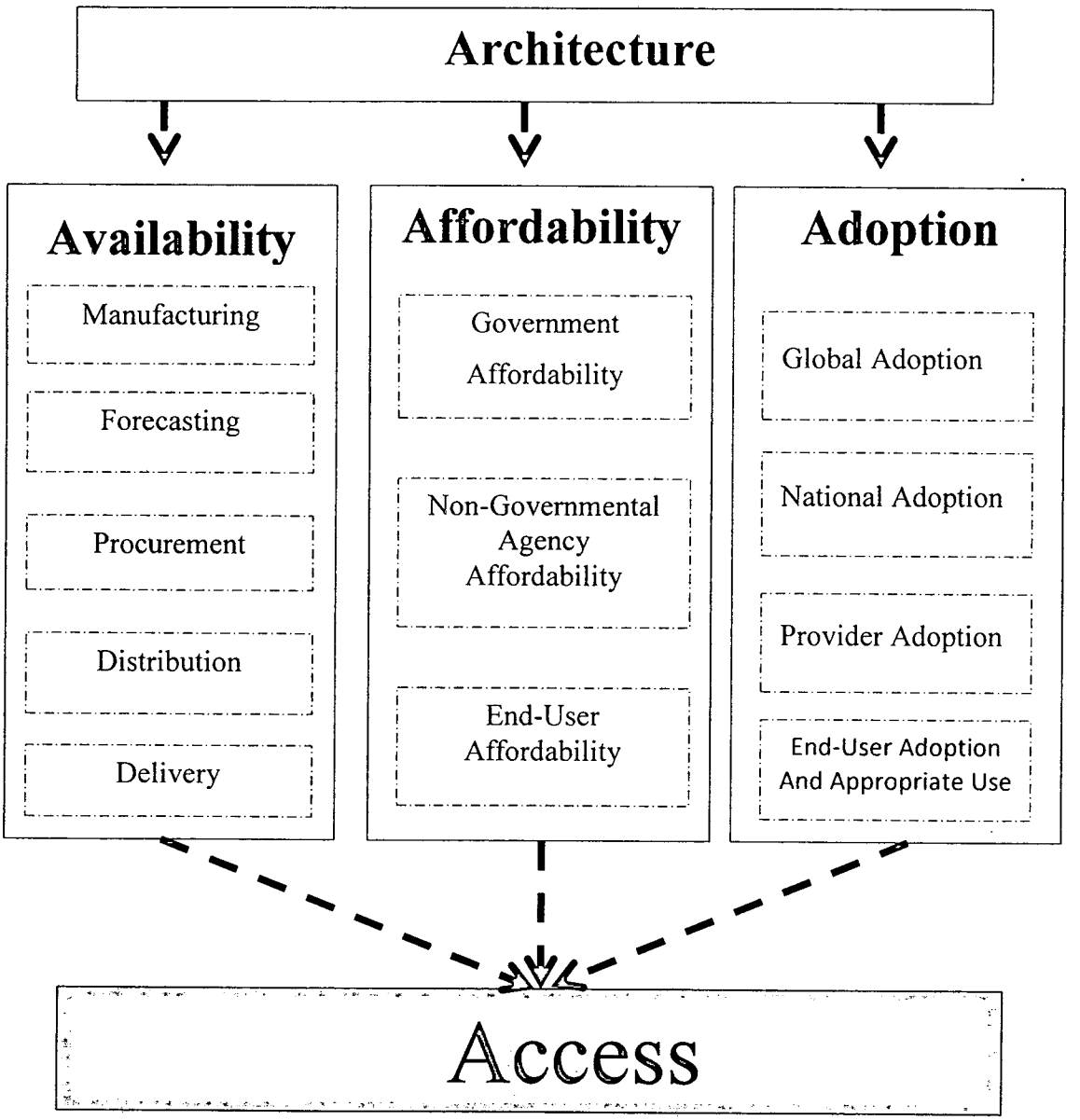
2.7. Access to health care

Access is defined as "the concept representing the degree of fit between the client and the system" to specific dimensions including availability, affordability, accessibility, accommodation and acceptability (Penchansky & Thomas, 1981), meaning that access is not just use of the health care system.is argued by Penchansky as not true, the argument emphasize that access is no synonymous to available or accessible but actually it is difficult to differentiate between the three terms

2.7.1. The access framework

The access framework based on four aspects, the availability which emphasize the supply component of the access; affordability stand for the cost issues to the different stake holder in the game; and adoption which clarify the demand factors and acceptance. The frame work has organisation component which is (architecture) to all four basic components (see figure 2.2) (Frost & Reich, 2008). The architecture which is the organizational part required to organise the three main activities to achieve access

Figure 2. 2 Access framework



Source: (Frost & Reich, 2008)

The second component involved here as mentioned before is *Availability*; which includes many activities at different level to ensure reliable and sustain supply. The actors involved in the access activities includes international organisations like WHO, private sector organisation at the global level like multinational pharmaceutical companies, and private –public donor as well as bilateral aid agencies, while with in the country the actors include the private distributors of technologies; national public sectors such as the ministry of health or a national regulatory authority; public sector regional, district, and community agencies such as health care providers in public

clinics; community-based distributors of health technologies; and end-users including patients and consumers.(Frost & Reich, 2008)

Now it is clear that are two basic important part of access and the health goal "access" cannot be achieved unless the four components are integrated together, part of this study will look on some aspect of the availability specifically delivery and procurement as well as the end user affordability.

2.8. Factors affecting medicine prices

2.8.1. Research and development

To develop new medicines cost a lot of money, because it is long research process it takes years to come up with new medicine, to develop new medicine in 1987 will cost US$281 million, while it cost US$ million in 2000 (DiMasi, Hansen, & Grabowski, 2003). May that the reason of high brand medicine price to compensate the cost of (Penchansky & Thomas, 1981)than what expected to recover the cost of production, the reason behind the development of patent guidelines in Canada to price new developed medicines should not go beyond the CPI(Sibbald, 2005)

2.8.2. Generic competition

Although economic theory required no to interfere with price regulation, majority of European countries regulate the price of the generic by different way e.g. maximum sales prices and the maximum reimbursement rate, price cap lead to the leveling off of generic prices(Puig Junoy, 2010), while intellectual property right may reduce generic medicines availability, while market competition and factors affecting demand size are most likely influence the generic suppliers, while the brand supplier set price to offset compulsory licensing and generic competition (Meiners, Sagaon-Teyssier, Hasenclever, & Moatti, 2011). However brand name medicines are lack of prices competition even when the patency is expired (Lexchin, 2004), although drug substitution has significant effect on medicines price (Aalto-Setala, 2008)