

Essential Medicine Utilization and Situation in Selected Ten Developing Countries: A Compendious Audit

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ABSTRACT

Medicine improves the quality of life and increases mean age of human beings as it fights against diseases. Accessibility to medicines is the fundamental right of every person. The principle of the essential medicines (EMs) is that a limited number of availability of medicine will promote to a better supply chain and rational prescribing to the rural and remote health centers for any developing countries. Furthermore, it was also expected that this concept will also ensure better procurement policy at lower costs, more in amount, with easier storage. Thereby, EMs will safeguard and improve distribution and dispensing of medicine. Correspondingly, motivational and dedicated training program regarding drug information and adverse drug reactions will boost up access to medicine and health-care. In addition, the selection of medicine from EM is the first step in the direction of the rational use of medicine and progress and ensuring the quality of health care. Thereafter, selection needs to be followed by appropriate use. Everyone should receive the right medicine, in an adequate dose for an adequate duration, with appropriate information and follow-up treatment, and at an affordable cost. The acceptance and implementation of World Health Organization-promoted EM policies in deferent countries have improved quality use of medicine in terms of accessibility and affordability, predominantly in developing countries. The corporations and teamwork among various participants of health care are instantly obligatory to progress equitable access to medicines in low- and middle-income countries.

KEYWORDS: *Developing countries, essential medicine, situation, utilization*

INTRODUCTION

The International Conference on Primary Health Care (PHC), Alma-Ata, USSR, September 6–12, 1978, strongly reaffirms that health, which is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity, is a fundamental human right and that the attainment of the highest possible level of health is a most important worldwide social goal whose realization requires the action of many other social and economic sectors in addition to the health sector.^[1] Currently, availability of medicines is considered as the most essential component of any effective health-care system. Modern pharmaceutical medicine cures, controls, and prevents many diseases and thereafter saves lives and promotes health. Medicine improves the quality

of life and increases mean age of human beings as it fights against diseases. Accessibility to medicines is too the fundamental right of every person.^[2] Essential medicines (EMs), as demarcated by the World Health Organization (WHO), are the medicines that “satisfy the priority health-care needs of the population.”^[3] The EMs should consequently be accessible always in sufficient quantities and in the suitable dosage forms and at a cost that a patient personally or society or country can bear. This notion was envisioned to be supple and adjustable

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to many different situations, precisely which drugs are viewed as essential remains a national accountability and obligation.^[4] Principle of the EMs model is that a limited number of availability will promote to a better supply chain and rational prescribing to the rural and remote health centers for any developing countries. Furthermore, it was also expected that this concept will also ensure better procurement policy at lower costs, more in amount, with easier storage. Thereby, EMs will safeguard and improve distribution and dispensing of medicine. Correspondingly, motivational and dedicated training program regarding drug information and adverse drug reactions will boost up access to medicine and health-care.^[5-8] In addition, the selection of medicine from EM list (EML) is the first step in the direction of the rational use of medicine (RUM) and progress and ensuring the quality of health care;^[9] thereafter, “selection needs to be followed by appropriate use. Everyone should receive the right medicine, in an adequate dose for an adequate duration, with appropriate information and follow-up treatment, and at an affordable cost.”^[2] Worldwide, more than 50% of all medicines are prescribed, dispensed, or sold inappropriately, while 50% of patients fail to take them correctly.^[10] Moreover, one-third of the world’s population lacks access to EM.^[11] This article will try to explore essential drug situation in 10 selected countries.

MATERIALS AND METHODS

The countries selected from Asia, Africa, North America, and South America conveniently. The articles were selected on basis of browsing in Google and Google Scholar the keywords: essential drugs, rational use of medicine, and the name of the country. Article furthermore selected on the basis of free download and utilizing Universiti Pertahanan Nasional Malaysia (National Defence University of Malaysia, Kem Sungai Besi, 57000 Kuala Lumpur, Malaysia) link. Thereafter, many efforts have been given to cover as much article can be downloaded free and later utilized to develop the manuscript.

ESSENTIAL DRUG SITUATION IN DIFFERENT DEVELOPING COUNTRIES

People’s Republic of Bangladesh

After the founding of Bangladesh after independence in 1971 needs to either import almost all medicines or donations from overseas.^[12] It was reported that from 1947 to 1971, nearly 70% of the medicines came to Bangladesh (the then East Pakistan) from Pakistan (the then West Pakistan) as most of the pharmaceutical industries in Karachi.^[12] Bangladesh currently is almost self-sufficient to produce medicine.^[13] Bangabandhu Sheikh Mujibur Rahman, the then Prime Minister

of Bangladesh, constituted a seven-member expert committee to regulate the quality and quantity of medicines to bring in the medicines from abroad and to control the price of imported medicines in 1973.^[14] The committee executed an injunction on many ineffective or non-EMs. This was the first step toward the rational use of drugs in Bangladesh.^[13] The Ministry of Health of the Government of Bangladesh in 1982 constructs an eight-member professional taskforce to appraise all the registered medicines currently available in Bangladesh and to evolve a draft National Drug Policy (NDP) that will comply and harmonize the national health necessities.^[15] The taskforce identified that out of 4500 registered brand products available in Bangladesh, about one-third were useless, unnecessary, or harmful^[15] and composed of a list of 160 medicines as essential drugs in line with the WHO commendations.^[12] Furthermore, the Drug (Control) Ordinance of 1982 adopted “WHO’s concept of essential drugs to both private and public sectors for Pharmaceuticals in Bangladesh (an essential drugs list had been used since 1978 for procurement by the Government’s Central Medical Stores).”^[16]

A study conducted outpatient departments of multiple health facilities of different levels in 920 patients revealed that at least 20% of the prescribed drugs were not on the existing EML of Bangladesh.^[17] This further concluded that noncompliance to the EML echoes that the prevailing EML of Bangladesh is not exhaustive and extensive enough to deliver the peoples’ requirements.^[17] Another study similarly reported that current EML in Bangladesh is not comprehensive enough to serve the majority people of Bangladesh.^[18] One more study in 2012 reported that the NDP 1982 could not assure rational use of drugs, safeguard the accessibility and low price of medicine for the common people of Bangladesh excluding the early years in the eighties. The current medicinal situation has relatively worsened in last two decades, especially regarding price hike, although medicines are more available in the shop.^[19] One study conducted in Sir Salimullah Medical College and Mitford Hospital, a tertiary care 600-bed Hospital, Dhaka, Bangladesh, reported that only 43.16% (467) drugs out of 300 prescriptions of 1082 drugs were prescribed from the EML of Bangladesh.^[20] Another cross-sectional descriptive study conducted in same teaching hospital 1 year later in the cardiology department found that out of 300 prescriptions, most of the drugs, i.e. 70% (1860), were prescribed from the EML of Bangladesh and only 30% drugs (680) were other than EML of Bangladesh.^[21] Another multicenter study conducted in 20 different health facilities of 119 health complexes in Dhaka Division of Bangladesh, the proportion of drugs prescribed which were on EML was 59%. This

study evaluated six common diseases – dysentery, acute respiratory infection, diarrhea, scabies, worm, and fungal infections of Bangladesh and 600 patients' profile.^[22]

Although it has been officially claimed that 80% of the Bangladeshi population has the possibility to access EMs at a reasonable price, a number of research studies have reported about the shortage of EMs in public health services.^[23,24] One study conducted in four district hospitals and one teaching hospital revealed that 8% of patients acknowledged about receiving the prescribed medicines from public health facilities they went for treatment.^[25,26] Another study reported that one prime teaching hospital of the capital city of Dhaka was operating without EMs for 8 consecutive weeks.^[27] There are innumerable such episodes involving to the supply of EMs in Bangladesh. The Bangladesh Government officials and bureaucrats including health-care authorities were answerable and accountable for the shortage.^[27] The government needs to be more conscious and vigilant of the poor availability EMs.^[23,28] The research studies mentioned above all were conducted principally in public hospitals of Bangladesh, but a very big portion of medicine utilized private sector both outpatient and in private small to large hospitals. Such research studies were not available.

Republic of India

The first ever Indian National Essential Medicine List (NEML) of was developed in 1996.^[29,30] Neither the first EML was executed to purchase medicines for health facilities, nor standard treatment guidelines (STG) were formulated.^[31] The EML was revised at least 3 times in 2003, 2011, and 2015.^[32,33] The EML 2015 of India “has been prepared adhering to the basic principles of Efficacy, Safety, Cost-Effectiveness; consideration of diseases as public health problems in India. The list could be called as a Best-Fit List.”^[34] The EML 2011 contains 348 medicines. A total of new 106 medicines have been included, and 70 medicines are deleted from EML 2011; thereafter, the new list of 2015 contains a total of 376 medicines.^[35] Government of India in 2011 has announced a policy designed to increase the availability of EMs at a reasonable cost; thereafter, common people can easily procure.^[36] The number of drugs was from initial 74 to 348. This policy again was brush up in 2012 and 652 commonly used medicines were incorporated as Indian EMs for 27 clinical needs.^[35] It has been anticipated that implementation and practicing of this policy will able to bring down the price of most of EM of India at least 10%.^[36] The Central Government of India has determined in the direction of Universal Health Coverage (UHC) that the National Health Assurance Mission will provide “50 priority EMs should be available at all times

at all levels to the citizens of India living below poverty line.”^[37]

The establishment of reasonably priced, standard quality with suitable dosage form of EMs is an indispensable element for an effective and useful health program for any country.^[38] Almost 10 million would survive if access to EMs can be improved; among those 10 million, 4 million are in Africa and Southeast Asia alone.^[39] However, providing universal access to EMs is a great challenge in low- and middle-income countries (LMICs).^[40] One study conducted in two prosperous state of India reported that broadly accessibility of medicines was 45.2% and 51.1% in Punjab and Haryana, respectively. Hypertensive patients of these two states at least 60% occasion have access to antihypertensive medicines; however, regarding antidiabetic medicines, it was 44% and 47% in Punjab and Haryana, respectively. Nevertheless, regarding analgesic/antipyretic, antihelminthic, antispasmodic, antiemetic, antihypertensive, and uterotonics, at least one medicine in each of the classes of medicine was accessible in public health centers. Thrombolytics, anticancer, and endocrine medicines were available in <30% in public health centers. Among these medicines have been reported that 8%–60% of these medicines were not available for about 3–6 months.^[38] Several studies also revealed that several drug procurement models to achieve UHC in India have been practiced in different states such as Tamil Nadu, Kerala, and Rajasthan and resulted in lowering price and improved accessibility of EMs for the common people in India through well-organized supply network program.^[38,41-43] As it has been revealed that “efficient drug supply management ensures sustainable access and availability of EMs in public sector. The performance of each component of the cycle (selection of EMs, procurement, distribution, and use of EMs) is linked with the performance of others”^[37] and RUM. Another Indian study reported that price control mechanism for medicine, especially for those listed in NEML, has much optimistic power to improve any public health-care system. Furthermore, utilization of generic version of medicine will reduce cost of treatment. Again, health-care cost will much-more reduced when price control category strategy is adopted along utilization generic medicine. Research also advocated that continued medical education must have made mandatory for restitution of registration of physicians.^[44]

One research conducted in Pune, India, found that out of 1105 prescription, audited essential drugs were 25–66%.^[45] Another research conducted in rural hospital revealed that out the 1483 prescribed medicine, 30.7% (456) were prescribed by pharmacological names and 77.61% were from EML. Only 20.13% prescriptions were proper and

rational.^[46] One more study conducted the Department of Dermatology at a Tertiary Hospital in Delhi revealed that only 23% of the medicines prescribed were from Delhi State Essential Drugs Formulary.^[47] Another prospective study conducted in outpatient department of private clinics and hospitals of East Godavari, Andhra Pradesh, India, has audited 690 prescriptions containing 2080 medicines. This study revealed that 41.6% (866) of the medicines were not prescribed from the WHO model essential list.^[48] Ninety-six prescriptions were collected between March 2007 and May 2007 prospectively from postoperative patients in the General Surgical wards of the Jawaharlal Nehru Medical College Hospital, Aligarh, India. This research revealed that 61.4% medicines were from the WHO model list (WHO-LIST) of EMs and no generic name was ever prescribed.^[49] Another cross-sectional study was conducted in 26 PHC facilities of the Madhya Pradesh analyzed 1052 prescription revealed that medicines prescribed from EML were 66.9% (1944/2906).^[50] Another a cross-sectional research study collected all pediatric outpatient prescriptions from four pharmacies of different wards of Nagpur city reported that 38.9% (1339) medicines were included in the EML of the WHO-LIST of EMs for children.^[51] Another study in five different states of India reported that state government procures medicines at a very rational and realistic price; nonetheless, the accessibility toward EMs was found very low. Consequently, much of the patients have no choices but to go private medicine shop, where generic medicines were generally obtainable but price is obviously high.^[52] One more study conducted in six randomly nominated districts of Odisha on 34 EMs. The accessibility of pediatric EMs in public health-care system of Odisha state is poor. These medicines for pediatric patient were high in both privately and nongovernmental organization owned medicine shop compared to the international reference price (IRP).^[53] Another cross-sectional study, regarding availability of five EMs (Vitamin A solution, syrup cotrimoxazole, oral rehydration salt, syrup paracetamol, and zinc sulfate oral liquids or tablets) for pediatric patient, conducted in 129 public health centers spanning 17 states of India, two union territories, and National Capital Territory of Delhi revealed that accessibility of these EMs was not reasonable good. The study found that 36%–100% cases were available in studied public health facilities.^[54] Although the Indian scenario regarding utilization of EM has improved, nonetheless, lot more to go to ensure health care for all.^[32,55]

Federal Republic of Nigeria

Nigeria embraces WHO-promoted essential drugs initiative as earliest possible time in 1987 during the time military ruler. The first ever EML contains 205 medicines for public health centers and hospitals.^[56,57]

Later, EML was also incorporated for private clinics and hospitals.^[58] The fifth edition was principally focused in synchronizing the medicines incorporated in the STG and the EML of Nigeria. In addition, the fifth also subsumed the new antimalarial drug strategy. Furthermore, new approaches regarding HIV/AIDS, tuberculosis/leprosy management were correspondingly adopted. The Federal Ministry of Health, Nigeria, jointly with WHO expect that the newly edited version edition of EML will have a much more positive impact on Nigerians health at the lowest price.^[59,60] Nigeria has been one of the most dynamic cohorts of the Bamako Initiative (BI) scheme, with the expectation as a tactical opening to assist local governments to accelerate and strengthen the PHC of the country.^[61] Nigeria adopted the BI program in 1988 with financial and technical support from the WHO, UNICEF, and the UK DFID.^[62] The principal attention and motivation of the initiative to confirm a stable supply chain for the most basic essential drugs, prescribed under generic names, at inexpensive prices and at the same time educating and enlightening prescribing performances.^[63]

One study conducted in Nigerian Army Hospital revealed that 90.5% of doctors were acquainted and familiar with of the existence of national essential drugs list; nevertheless, only 58.1% of them did not use for their prescriptions.^[64] Another cross-sectional descriptive study audited 600 patient medicine profiles revealed that 83.2% were from the NEML and 86.5% of essential drugs were obtainable in the public PHC of Lagos State, Nigeria.^[65] One more descriptive drug utilization study carried out prospectively in 2015 at the Ahmadu Bello University Teaching Hospital, Zaria, Nigeria, revealed that 91% antibiotics prescribed from the NEML.^[66] Another research was conducted on four randomly selected public PHC in Osun State, Nigeria, in 2006–2007 reported that 94.16% of medicines prescribed were from the NEML. Nevertheless, the study also found that there was a high propensity of polypharmacy, use of antibiotics and injections, and a shortage of highly skilled workforce.^[67] Another descriptive retrospective research was conducted at the general outpatient unit of the Aminu Kano Teaching Hospital reported that 94% of the drugs prescribed were from NEML even though a hard copy of EML was not obtainable for the doctors. In addition, 91.7% of the most important medicines for common diseases were available.^[68] A cross-sectional descriptive study conducted among 70 medical doctors at level of medical officers, registrars, and consultants in various clinics of a 300-bed tertiary hospital revealed that the most (51.4%) of the studied respondents were aware of NEML. The much (77.1%) of the respondents claim

to have a hard copy of EML.^[69] The situation and utilization of national EMs have improved. Even then, Nigeria needs to go much more to reach an ideal level, particularly in the public health facilities.^[55]

Republic of Kenya

The first Kenya EML (KEML) was introduced in 1981 with four succeeding amendments in 1993, 2003, 2010, and 2016.^[70-73] The accountability and obligation to supervise whether KEML functioning were not evidently defined even though the country has EML for 36 years.^[74,75] In addition, there are no in black and white terms of references to control the growth and preservation of the KEML.^[75] The KEML evaluation, progress, and advancement process have very often come across innumerable opposition and confrontation.^[72] The document has been considered as an important strategic and reference book for the health sector. Very hard work was continually made to confirm that KEML is resourceful, modernized, efficiently dispersed, and consistently used for day-to-day prescribing medicines.^[72]

A retrospective longitudinal before-after study at Webuye District Hospital, Kenya, reported that expenditure on EMs by the government reduced ($P < 0.0001$). The stock-out rate decreased by 2.28% though this change was not statistically significant ($P = 0.099$).^[76] The study finding may have an influence of the National Hospital Insurance Fund. Another study conducted in public hospitals of Nakuru County, Kenya, reported that most of the EMs – antimicrobials, analgesics, antihypertensives, emergency medicines, and pediatric formulations – were out of stock. Poor distribution, financing, inappropriate selection of medicine, and irrational prescribing were the causes of out of stock.^[77] One Masters' research thesis reported that the average monthly stock-out time reduced from 21.75% in 2010–2011 to 19.47% in 2012–2013. Nevertheless, Wilcoxon signed-rank test analysis exhibited that the median difference in monthly stock-out time among the two epochs was not significant ($P = 0.099$).^[78] One of the most important restraints of the Essential Drugs Program of Kenya was indecorous supply chain often due to futile buying and dispersal of essential drugs to the rural health centers in Kirinyaga District, Kenya.^[79]

Federative Republic of Brazil

The Government of Brazil is steadfast to provide best possible health care for all citizens, including the distribution free of charge particularly of EMs intended to treat the predominant diseases of the country. Correspondingly, the government also provides high-priced medicines for treating sparse diseases or medicines aiming small community (e.g., Crohn's disease, hepatitis B, and hepatitis C) free of charge, based on

the standard therapeutic guidelines and protocols from the Ministry of Health.^[80-82] Brazil has an NDP defined by decree that comprises the national list of EMs as an instrument for its execution.^[83,84] This inventory is a wide-ranging list that orients the universal accessibility of medicines in the national health program. Almost after four decades, the first Brazilian EML was formulated; many research reported that EMs were moderately available in Brazilian public health facilities.^[85-88] The up-to-date seventh edited version that was released in 2010 has more and more been included medicines and its formulations for pediatric use.^[89,90] It has been reported that in general, the accessibility of EMs in the public health centers was 68.8%–81.7%. There are some popular pharmacies in Brazil those centers the mean obtainability of EMs >90% in all over the country.^[91] There are two types of popular pharmacies: (a) those which are run by the public or university-funded health centers. These pharmacies have medicines stock for the utmost predominant diseases of Brazil or expensive medicines for individuals to procure. A list comprising 95 molecules is sold at cost prices in these medicine shops. Thereafter, these facilities are considered as exclusive “popular pharmacies;” (b) those which are run in partnership with private drugstores with a system of co-payments. This group was established in 2006 to increase the popular pharmacy program especially for chronic medication for hypertension, diabetic, and contraceptives. The Government of Brazil provides 90% of the charge; however, the patient pays the residual 10%.^[91,92] Brazil has been identified as higher accessibility of EMs equated to non-EMs predominantly in the public health centers and in low- and lower-middle-income nations.^[55]

The quality and storage of EMs settings were considered as an imperative question and time-to-time assessment has been advocated.^[93] The primaquine and quinine samples were found not up to the mark of therapeutic quality, and deterioration was not due to poor storage settings. Several troubles observed with the slow release mefloquine tablets. It has formulation problems or influenced by inadequate storage conditions. Therefore, these urgent medicines for malaria are developing resistant to malarial parasite. Consequently, researchers demanded very urgent intervention from necessary authority.^[93] Another study reported that retail prices for EMs in Brazil are well-nigh double of the same medicinal product in Sweden and considering that Brazil's average people's earning is 10 times lower. Subsequently, price restriction for EMs, especially for low-income Brazilians, has been advocated to improve health care.^[82] The same study also concluded that competition alone is not adequate to secure reasonably priced EMs in Brazil.^[82] Competitive pricing regarding EMs might not generate any benefit

for common people if there are other nonpatent-linked influences that limit access and struggle, the most imperative being absence of a national generic medicine industry or policies to simplify generic imports from the cheapest sources. All developing nations do not have had such competencies or strategies.^[94] The Affordable Care Act depends on amplified practice of generic medications to counterbalance the prices of extended coverage.^[95] Although medical doctors prescribe generic version was high, nevertheless, below the standard pharmaceutical product, very low patient understanding and inadequate availability EMs often efficiency of Brazilian health-care program loosed principally for chronic illnesses.^[82]

Mexico

The efficacy, safety, and cost of marketed medicines are foremost apprehensions in all over the planet.^[40] Many countries across the planet have adopted WHO-promoted EMs program; nonetheless, several studies had been reported that local formularies do not match with WHO-LIST medicines and/or an oversupply of ineffective, dangerous and along with a surplus of me-too medicines and drugs with no compelling evidence to assess their alleged benefit.^[96-99] The Mexican Formulary List (MEX-LIST) contains 771 medicines, which is 2.4-fold more than the WHO-LIST ($n = 321$). Up to 236 medicines in the MEX-LIST impeccably match the WHO-LIST medicines, 40 could be measured as realistic alternatives, but 45 (14.0%) present in the WHO-LIST are not present in the MEX-LIST, together with an overabundance of 495 medicines. Rationality level could be analyzed for 353 of these: 43.1% ($n = 152$) were classified as nothing new, 12.2% ($n = 43$) as not acceptable, and 6.2% ($n = 22$) as judgment reserved due to inadequate data. In summary, 61.5% of the assessed medicines present in the MEX-LIST but not contained within the WHO-LIST ($n = 217$) can be measured drugs that do not enhance considerable clinical benefits, this accounts for 28.1% of the medicines in the MEX-LIST.^[100] In Mexico, women are eligible for medical and obstetrical consideration, medicines, nursing aid, and infant-care services. Workers and their family also entitled for medical services along with medicines, in those cases and in the proportions quantified by Mexican constitutional law.^[101] One study reported that in 2008 identified “provisions on essential medicines, goods, and services in only four national constitutions worldwide: Mexico, Panama, the Philippines, and the Syrian Arab Republic.^[101] Since 2008, Several counties have brush up and revised prevailing constitutions or formulated new constitutional law,^[102] sometimes in response to the altering “political, social, and economic circumstances caused in part by the global financial crisis, the European debt crisis, and the Arab Spring.”^[103]

The EML is no longer evidence-based due to the execution of the public insurance arrangement in Mexico. Two Mexican health-care services were analyzed, each having an institutionalized list and NEML, but eclectic difference has been observed between the two lists, representing a lack of uniform principles for selection.^[104] Another multicenter study reported that EML 2011 includes all potential antiretrovirals, antimalarial, antitubercular, major share of cancer chemotherapeutic and antidiabetic agents. Although, government provide cardiovascular diseases and mental health-care (100%) as a part of public health. Cardiovascular (CVS) medicines were accessible in EML but access to primary and acute care of CVS diseases were observed low. Similarly, quality of acute cerebrovascular diseases care also reported to be low. Furthermore, psychiatric diseases were often being neglected. Although the EML includes reasonably recent drugs such as olanzapine and quetiapine, usage appears to be quite low.^[105] Mexico made great efforts to promote generic drugs as a “part of a powerful set of developments in international pharmaceutical politics in which activist and state mobilizations over access to pharmaceuticals – particularly HIV/AIDS medications – have become a powerful site for the reassertion of the national public interest” as counterbalances to internationalized intellectual property management policies.^[106]

Federal Democratic Republic of Nepal

The first ever the National List of EML was published in 1986. The list was brushed up in 1992, 1997, 2002, and 2011.^[107,108] The Nepalese government defined EMs are those that fulfill the main concern of health-care needs of the whole population. EMs were selected with due respect to disease prevalence, evidence on safety and efficacy, and comparative cost-effectiveness. EMs were intended to be accessible within the context of operational health systems at all times in satisfactory amounts, in the suitable dosage forms, with standard therapeutic quality, and at a reasonable price that people can afford both individual and community level.^[107] The fourth amendment of the list is also founded on the same ideologies.^[107] The Nepalese interim constitution in 2007 declared that health care as a basic human right and afterward essential health-care services should be delivered for free of cost for the country’s population.^[109] Thereafter, the government has started to provide free basic health care, including medicine, at the subhealth post, health post, primary health-care center, and district hospital.^[107] Consequently, implementation concept of EMs and providing necessary medicines for peoples of Nepal is the answer for the Nepalese Government.^[107] The Nepalese EML 2011 contains 321 drugs divided into core and complementary. The government is currently providing 40 of these medicines free of charge at district-level

public health centers but have in recent times augmented to 70 drugs.^[110] Although Government of Nepal has the commitment to provide medicines free of charge at public health facilities, timely availability of EMs in far-off remote rural areas has been a serious concern that necessities need to be addressed.^[111]

One study evaluating the cytotoxic medicines utilization in Nepal reported that anticancer medicines were prescribed by brand names as per the hospital policy. The medicines prescribed from WHO model EML and NEML of Nepal were 67.40% and 73.72%, respectively.^[112] One study at the Manipal Teaching Hospital, Pokhara, Nepal, was carried out over 1-year period in surgical outpatient department evaluating 595 prescriptions found that 41.2% and 36.4% medicines were prescribed from the NEML list of Nepal and the WHO model EML, respectively.^[113] A prospective study conducted in a teaching hospital in Western Nepal revealed that 21.7%, 32.8%, and 42.3% WHO model EML, the NEML, and Nepalese National Formulary respectively.^[114] All health facilities had availability of EMs. The availability most important EMs in the Nepalese PHCs was 89.69%.^[115] Another cross-sectional study conducted in teaching hospital revealed that 41.76% and 38.20% medicines were prescribed from the WHO model EML and the Nepal NEML, respectively.^[116] Another study conducted in a tertiary care teaching hospital of Western Nepal found that only 37.09% and 31.06% of the drugs prescribed were from the EML of Nepal and WHO model EML list, respectively. A very high percentage (97.92%) of the medicines prescribed from the hospital drug list and 47.75% of the drugs were from the Nepalese National Formulary.^[117] One more study on rational drug prescribing conducted in a tertiary care teaching hospital of Western Nepal reported that 40% and 29.44% of medicines were from the EML of Nepal and WHO model EML, respectively. It was also found that 54.17% and 35.69% of the medicines were prescribed from Nepalese National and WHO model formulary, respectively.^[118] One more study found that 90.3% of prescribed medicine conformed to a model list of essential drugs and 76.9% were dispensed by the hospital pharmacy.^[119] Another research prescribing patterns among pediatric inpatients in a teaching hospital in Western Nepal reported that 44.8% and 45.7% were prescribed from the NEML of Nepal and WHO model EML, respectively. Again, 58.1% were prescribed by generic name.^[120]

Federal Democratic Republic of Ethiopia

Currently, pharmacotherapy has always been an inherent fragment for any effective and successful health system. It is also predicted that effective pharmacotherapy will remain an essential component of health care in the upcoming days. The accomplishment of any effective health care and pharmacological interventions depends

relies on the availability of safe, effective, and reasonably priced medicines with the required quality, in realistic amount. The rational prescribing, dispensing, and use of such medicines also remain parallel for the triumph of health care. Ethiopian drug policy safeguards that medicines which are obligatory for prevention, diagnosis, treatment, mitigation, and rehabilitation of ailments upsetting common Ethiopian folks must be recognized and categorized to corresponding levels of health system delivery.^[121] The EML was first introduced in 1980 and revised regularly in 1989, 1996, 2002, 2007, and 2010.^[122] The Ethiopian EML was hereby reassessed and rewritten multiple times in considering mentioned principle and the latest developments in fields of evidenced-based medicine. Hereafter, users of the Ethiopian EML were recommended to check the list on every occasion prescriber offer the medical services in the different level of the health system.^[121] The sixth edition of EML were developed to address the three levels of Ethiopian health care and prescribers were strongly advocated to utilize the list to ensure rational prescribing.^[122]

The typical obtainability of EMs was 43% and 42.8% at public and private the Ethiopian health facilities, respectively. These EMs were sold at the median of 1.18 and 1.54 times their IRPs in the public and private health facilities, respectively. Again, a patient needs to pay 36% times higher in the private than in the public health centers. In general, medicines were high priced for the treatment of common sickness prevalent in the community. Henceforward, the price of the medicines was so high that it consumes the whole of a day earning even for the lowest paid public unqualified employee.^[123] Another Ethiopian study reported that accessibility of EMs was 91% and 80% of public and private health-care facilities, respectively. Nonetheless, according to the exit interview, 84% patients claimed that they obtain all prescribed medication. Although nearly half of the prescribed medicines were purchasable at reasonable price from government supported medicine shop, one in every six patients was compelled to buy medicine from privately operated medicine shop, where medicines were expensive and double the price public drug store. The waiver policy exists but not efficient enough to ensure to obtain medicines free of cost.^[124] One more study conducted in Southwestern Ethiopia revealed that low availability of EMs in public health system destined patients to go private pharmacies or forego treatment/traditional and complementary cheaper options. 47.83%, 33.54%, and 18.63% of the research participants opined that the drugs are not affordable, fairly affordable, and affordable, respectively. The study participants also opined that a major portion of the family income need spent health care; henceforward, they described the cost of treatment

is expensive and skyrocketed high.^[125] Out of 1426 encounters studied, 92% (1311) were from the NEML. The proportion of medicines prescribed by generic name was 97% and antibiotics and injections constituted 82.5% and 11.2%, respectively, found in a study conducted in public health facilities of Eastern Ethiopia.^[126] Another drug utilization cross-sectional study conducted on prescribers in health centers of Southwest Shoa Zone, Ethiopia, reported that availability of EMs was 72%, and 86% and 88% of prescribers note the cost of drugs and stick to STG of Ethiopia during prescription, respectively. Again 76% of prescribers had right and the opportunity to modern medicine information; nevertheless, 43.3% of dispensers did not possess and utilize to latest medicinal information.^[127] An EMs concept was introduced to Gidole Hospital, Gamu Gofa Region, Southwestern Ethiopia, in 1980. Drug usage pattern studied among inpatients retrospectively for the two 1-year periods demonstrates that there was a change in prescription quality toward rational prescribing with a significant diminution of nonessential and placebo drugs as well as vitamin injection.^[128] Another cross-sectional study for on patients who visited the outpatient departments of the four hospitals of Southern Ethiopia in 2014 reported that, on an average, 65.5% key medicines were available. The overall mean number of medicine drug prescribed per patient was 2.0 ± 1.2 . The 45.4% medications were clearly labeled. In addition, none of the outpatient medicine-outlet in these hospitals has at least either a copy of National Drug Formulary, EML or STG, excepting one hospital.^[129] Additional cross-sectional research at Hawassa University Teaching and Referral Hospital, South Ethiopia, appraising drug use pattern using WHO prescribing indicators revealed that 96.6% ($n = 2367$) of prescribed medicines were from EML and utilization of generic name was 98.7% ($n = 2419$). Antibiotics were prescribed at Hawassa University Hospital was 58%, which is very high compared to the typical WHO standard for communities prone to high level of infective disorders.^[130]

Malaysia

Malaysia's national medicines policy was first established in 2006.^[131] The policy comprises core apparatuses to ensure the quality, safety and efficacy of medicines, drug availability, drug affordability, and quality use of medicines. It as well contains helpful mechanisms of human resource development, research and development, technical cooperation, and management. The Minister of Health announced on February 17, 1995, to implement a NEML. As a result, many dubious medicinal products circulating in the local market of Malaysia were banned and withdrawn; hereafter, Malaysians common people enjoys and benefited with such a progressive

policy.^[132] The fourth edition Malaysian EML has been published in 2014. The current version EML contains 321 chemical entities within 30 therapeutic groups. The therapeutic groups are further divided into subtherapeutic groups followed by the medicines' generic names and corresponding dosage form and the level of care. The list divided into three levels of care: (i) universal caters primary, secondary, and tertiary care health clinic and hospital, (ii) secondary caters secondary and tertiary care major/minor specialist hospital, and (iii) tertiary caters tertiary care major specialist hospital.^[133] Knowledge of the influence of the medicines policy, particularly on access to and use of medicines, is very vital to organize additional progress and execution.^[134] Malaysian government monitors medicine uses and accesses utilizing several public machinery and data sources.^[135]

One study evaluated medicine utilization in 20 public hospitals, 32 private sector pharmacies, and 20 dispensing doctors' clinics reported that overall availability of EMs was also found low.^[136] This study^[136] recommended that it was impracticable to think that access of EMs will improve with an unregulated and free market economy in Malaysia. The same research also indorsed that a pricing policy is required, and it should be combined into the NDP. This policy should aim to improve the accessibility of reasonably priced generic medicines.^[136] As medicines are provided free in the public sector, affordability has been assessed only for the private sector. A 1-month treatment with innovator brand ranitidine for peptic ulcer required 7.5 days' and 8 days' earnings when bought from private drugstores and clinicians' clinics, respectively. The cost of generic versions of ranitidine was 3 days' and 3.7 days' earnings when obtained in the private drugstore and clinicians' clinics, respectively.^[136] Another comparative survey conducted in 20 public health clinics and 20 private retail pharmacies regarding the availability of EMs, the prevalence of stock-outs and affordability of treatment.^[137] The mentioned study^[137] adopted WHO protocol to conduct the research work.^[138] The regular accessibility of vital medicines in the public health clinics of Malaysia was 95.4%. The usual stock-out period of vital medicines was 6.5 days. However, typical accessibility of vital medicines in the Malaysian government district medicine stores was 89.2%, with a typical stock-out duration of 32.4 days. Medicines prescribed were 100% give out to the patients. Average affordability was 1.5 weeks' and 3.7 weeks' wages for public and private drugstores, respectively.^[137] This stated study^[137] investigated that only 13 vital medicines and details of 13 medicines were not described. Another study reported that antihypertensive, antidiabetic, and agents used in dyslipidemia are the three most highly utilized medicines in Malaysia and this links with the

known high pervasiveness of diabetes, hypertension, and hyperlipidemia; nevertheless, these diseases were reported to be not managed adequately.^[139] A countrywide investigation was conducted in 20 randomly selected through PHC, 30 outpatient encounters at each PHC were sampled, covering approximately 2.5% of the total number of PHC of the country, data were utilized regarding prescribing behaviors in five different regions of Malaysia.^[140] Interestingly, all 600 ($20 \times 30 = 600$) encounters were prescribed 100% from NEML, but none kept the EDL in their PHC.^[140] Another study reported as like earlier study^[136] that affordability was calculated and described as the number of days' pay required by minimum earning group to pay for 1-month treatment. The number of day's income would have to pay by the worker ranged from 0.11 to 6.56 days', 0.13 to 2.88 days', 0.13 to 4.70 days', and 1.04 to 2.93 days' pay for the treatment of hypertension, diabetes, and asthma and for multiple conditions, respectively. Low affordability was noted for most of the innovator branded medicine, most combined treatments, and all multiple chronic cases treatments.^[141] One more study reported that among 81 most frequently used medicines, 63 were innovator brand and 18 were generic. Yet again, of identified 81 medicines, 33% (26) were from the Malaysian EML. Angiotensin-converting enzyme inhibitors, β -blockers, and Ca^{2+} channel blockers were among the most frequently used medicines. In addition, public sector prices were found to be lower than private sector prices. Furthermore, public sector prices when compared with IRPs, the prices of some of medicines were found to be higher, from a maximum of 2100% for tablet amlodipine 5 mg to a minimum of 9.75% for tablet ibuprofen 200 mg.^[142] Accessibility of new medicines in Malaysia, the growth of public health program, amplified prescription bulk and medicine prices are issues associated with increasing medicine prices.^[143] Overall, generic medicine holds a price lowering potential while competing with innovator brand in Malaysia which has a positive impact in lowering the cost of health care. Nevertheless, the picture would be much evident if the speedy and adequate entry of generic medicines in medicine market of Malaysia.^[144] Researches those found high utilization of EMs were studied in public hospitals or PHCs where prescribers need to prescribe from hospital supply; hereafter, it is possible to find high utilization of EMs in Malaysian public health-care system.

Republic of South Africa

The careful and cautious selection of a limited number of EMs consequences in better-quality medicine management boosted the quality of health care.^[145] The EML is an ultimate instrument which guides countries in the procurement and distribution processes and

which eventually cuts costs to both the health care for individual, community, and country.^[2,146] The EM initiative of South Africa was built as the NDP which was instigated in 1996 since the instatement of the country's new democratic government in 1994.^[147,148] The NDP aims to make available equal access to medicines for all the citizens of South African through the EMs program, which will consist of an EML and STG. The high cost of medicines demanded the evolution and consistent evaluation of the EML. The justification for evolution and upholding an EML is to make available equal access to medicines, improved supply of the insufficient medicines, and consequently lower cost of medicines procured.^[147] South Africa has since been struggling in health-care improvement and reorganization to confirm impartial and reasonable access to health care and medicines for all peoples, particularly those beforehand underprivileged by the ethnically fragmented and under-resourced health-care facilities formed by the apartheid system.^[149] Since 1996, STG/EML has been revised 12 times and published for two levels of healthcare, (i) a PHC book and (ii) separate books for adult and pediatric hospital level.^[150] The results of the study exposed that the nurse prescribers had a good knowledge and skill regarding the use of the STGs and the EML. There was no indication found of polypharmacy, and medications were prescribed conferring to the STGs and the EML guidelines. Investigators, in conclusion, recommended that training on the utilization of the STGs and EML was insufficient, which point toward the need for firming up of continued educational program.^[151] Systematic in-service educational programs for all level health-care professionals are required to strengthen and modernize their knowledge and skills in the clinical area. It is indispensable that managers and administrators carry out consistent assessments of records to monitor and maintain the high quality of health care.^[151]

CONCLUSION

Although there has been progressing to access to health care of low-income countries, nevertheless, considerable proportions of their populaces have restricted access. The poor people of these countries "suffer from a disproportionate burden of disease yet usually have less access to health care, whether measured by geographic accessibility, availability, financial accessibility, acceptability, or quality of care."^[152] The EMs concept introduced since 1977 a notable invention in health care and currently extensively recognized as a highly rational and sensible strategy to provide "the best of modern, evidence-based and cost-effective health care." The challenge is to recurrently bring up-to-date medicine to choose in the light of new therapeutic "preferences,

changing therapeutic needs, the need to ensure drug quality and continued development of better drugs, drugs for emerging diseases and drugs for coping with changing resistance patterns.”^[153] There is also a need to fill gaps in availability, accessibility, and affordability of medicines to the poor.” Thereafter, acceptance and implementation of WHO promoted EMs policies in deferent countries have improved quality use of medicine in terms accessibility and affordability, predominantly in developing countries.^[154] Another study concluded that corporations and teamwork among various participants of health care are instantly obligatory to progress equitable access to medicines in LMICs.^[155] The struggle to access to EMs recognizes to progress regarding access to EMs, “six C’s are needed: coalitions, civil society, citizenship, compromise, communication, and collaboration.”^[156]

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CONFLICTS OF INTEREST

There are no conflicts of interest.

REFERENCES

1. Declaration of Alma-Ata International Conference on Primary Health Care, Alma-Ata, USSR; 06-12, September, 1978. Available from: http://www.who.int/publications/almaata_declaration_en.pdf. [Last accessed on 2017 May 24].
2. Kar SS, Pradhan HS, Mohanta GP. Concept of essential medicines and rational use in public health. *Indian J Community Med* 2010;35:10-3.
3. World Health Organization (WHO). Essential Medicines and Health Products. Essential Medicines; 2017. Available from: http://www.who.int/medicines/services/essmedicines_def/en/. [Last accessed on 2017 May 24].
4. Essential Medicines and Health Products Information Portal. A World Health Organization Resource. The Use of Essential Drugs: Ninth Report of the WHO Expert Committee; 2000. Available from: <http://www.apps.who.int/medicinedocs/en/p/printable.html>. [Last accessed on 2017 May 24].
5. World Health Organization (WHO). Access to Affordable Essential Medicines. Available from: <http://www.who.int/medicines/mdg/MDG08ChapterEMedsEn.pdf>. [Last accessed on 2017 May 26].
6. PATH, the World Health Organization, and the United Nations Population Fund. Essential Medicines for Reproductive Health: Guiding Principles for Their Inclusion on National Medicines Lists; 2006. Available from: http://www.who.int/medicines/publications/EssMeds_RHealth.pdf. [Last accessed on 2017 May 26].
7. Foster S, Laing R, Melgaard B, Zaffran M. Ensuring supplies of appropriate drugs and vaccines. In: Jamison DT, Breman JG, Measham AR, *et al.*, editors. *Disease Control Priorities in Developing Countries*. 2nd ed., Ch. 72. Washington, DC, New York: The International Bank for Reconstruction and Development/ the World Bank, Co-Published by Oxford University Press; 2006. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK11723/>. [Last accessed on 2017 May 26].
8. World Health Organization (WHO). The Selection of Essential Medicines. The Concept of Essential Medicines. WHO Policy Perspectives on Medicines; 2002. Available from: <http://www.apps.who.int/medicinedocs/pdf/s2296e/s2296e.pdf>. [Last accessed on 2017 May 26].
9. Contact. Promoting Rational Use of Medicines. A Publication of the World Council of Churches; 2006. Available from: <https://www.oikoumene.org/en/what-we-do/health-and-healing/con183e.pdf>. [Last accessed on 2017 Jun 20].
10. World Health Organization (WHO). Promoting Rational Use of Medicines: Core Components; 2002. Available from: <http://www.who.int/medicines/publications/policy/perspectives/ppm05en.pdf>. [Last accessed on 2017 Jun 04].
11. World Health Organization (WHO). The World Medicines Situation. Ch. 7; 2004. Available from: <http://www.apps.who.int/medicinedocs/pdf/s6160e/s6160e.pdf>. [Last accessed on 2017 Jun 04].
12. Islam N. Bangladesh national drug policy: An example for the third world? *Trop Doct* 1999;29:78-80.
13. Kabir K. Bangladesh Pharma Industry: Opportunities in Global Generics; 2016. Available from: <https://www.google.com/search?q=Bangladesh+pharmaceutical+growth&spell=1&sa=X&ved=0ahUKewiU57GMq5DUAhUIqJQKHebyA18QvwUIJCgA&biw=1280&bih=566>. [Last accessed on 2017 May 27].
14. Islam N. Jibron Srote. Bangladesh: ANWT; 1991. p. 174-5.
15. Islam N. On a national drug policy for Bangladesh. *Trop Doct* 1984;14:3-7.
16. Reich MR. Bangladesh pharmaceutical policy and politics. *Health Policy Plan* 1994;9:130-43.
17. Akter SF, Rani MF, Rathor MY, Aris MA, Jabbar MA, Mazumder SK. Hospital physicians’ drugs prescription adherence to the essential drugs list of Bangladesh. *Int J Appl Sci Technol* 2012;2:71-5.
18. Akter SF, Rashid MA, Mazumder SK, Jabbar SA, Sultana F, Rahman MH, *et al.* Essential drugs in Bangladesh and role of different stake holders – A qualitative study. *Int J Sci Environ Technol* 2012;1:506-18.
19. Ahmed SM, Islam QS. Availability and rational use of drugs in primary healthcare facilities following the national drug policy of 1982: Is Bangladesh on right track? *J Health Popul Nutr* 2012;30:99-108.
20. Alam MM, Parveen F, Ara F, Iqbal MJ, Saha RR. Prescribing trends in the out-patient department in a tertiary hospital in Bangladesh. *Bangladesh Med J* 2011;40:8-12.
21. Afroj F, Parveen F, Ara F, Iqbal MJ, Saha RR, Rozari RJ. Patterns of drug utilization in cardiology department of a tertiary level hospital in Bangladesh. *Bangladesh J Physiol Pharmacol* 2012;28:1-4.
22. Alamgir KM, Ahmed M. Studies on drug use pattern and cost efficiency in Upozilla Health Complexes in Dhaka division of Bangladesh. *Am Sci Res J Eng Technol Sci* 2015;14:178-86.
23. Islam MS. Therapeutic drug use in Bangladesh: Policy versus practice. *Indian J Med Ethics* 2008;5:24-5.
24. Government of Bangladesh and United Nations (UN) Country Team. Millennium Development Goal (MDG) Progress Report; 2005. Available from: <http://www.un-bd.org/undp/mdgs/Bangladesh%20MDG%20Progress%20Report%202005.pdf>. [Last accessed on 2007 Apr 29].
25. Omer K, Cockcroft A. Bangladesh hospital improvement initiative: Follow up community based users’ survey (Final report). CIET Europe; 2003. Available from: http://www.ciet.org/_documents/2006227135026.pdf. [Last accessed on 2017 Jun 03].
26. Omer K, Cockcroft A, Andersson N. Impact of a hospital improvement initiative in Bangladesh on patient experiences and satisfaction with services: Two cross-sectional studies. *BMC Health Serv Res* 2011;11 Suppl 2:S10.
27. Oxfam. Cut the Cost: Make Vital Medicines Available for Poor People (Bangladesh). Available from: <http://www.policy-practice.oxfam.org.uk/publications/make-vital-medicines-available-for-poor-p>

- people-bangladesh-112437. [Last accessed on 2017 Jun 03].
28. Islam MS. A review on the policy and practices of therapeutic drug uses in Bangladesh. *Calicut Med J* 2006;4:e2.
 29. Sharma S, Kh R, Chaudhury RR. Attitude and opinion towards essential medicine formulary. *Indian J Pharmacol* 2010;42:150-2.
 30. National List of Essential Medicines of India; 2011. p. 1-127. Available from: <http://www.apps.who.int/medicinedocs/documents/s18693en/s18693en.pdf>. [Last accessed on 2017 Jun 04].
 31. World Health Organization (WHO). Regional Office for South-East Asia. Better Medicines for Children in India, Report on Informal Consultation, WHO-SEARO, New Delhi, India; 2010. Available from: http://www.searo.who.int/entity/medicines/documents/better_medicine_for_children_in_india_2010.pdf. [Last accessed on 2017 Jun 04].
 32. Maiti R, Bhatia V, Padhy BM, Hota D. Essential medicines: An Indian perspective. *Indian J Community Med* 2015;40:223-32.
 33. World Health Organization (WHO). Essential Medicines and Health Products Information Portal. National List of Essential Medicines (NLEM) 2015-India; 2015. Available from: <http://www.apps.who.int/medicinedocs/documents/s23088en/s23088en.pdf>. [Last accessed on 2017 Jun 04].
 34. World Health Organization (WHO). Essential Medicines and Health Products Information Portal; 2015. Available from: <http://www.apps.who.int/medicinedocs/en/d/Js23088en/>. [Last accessed on 2017 Jun 04].
 35. Bandameedi R, Mohammed S, Soma H. A case study on National List of Essential Medicines (NLEM) in India and WHO EML 2015-overview. *Pharm Regul Aff* 2016;5:159.
 36. EOS Intelligence. Incisive Research. Actionable Insights. Essential Drugs in India: Is it all About Affordability? Available from: <http://www.eos-intelligence.com/perspectives/?p=36>. [Last accessed on 2017 Jun 04].
 37. Sharma S, Chaudhury RR. Improving availability and accessibility of medicines: A tool for increasing healthcare coverage. *Arch Med* 2015;7:12.
 38. Prinja S, Bahuguna P, Tripathy JP, Kumar R. Availability of medicines in public sector health facilities of two north Indian states. *BMC Pharmacol Toxicol* 2015;16:43.
 39. Zarocostas J. Better access to medicines could save 10 million lives a year, says UN expert. *BMJ* 2007;335:635.
 40. Kaplan W, Mathers C. The World Medicines Situation 2011. Global Health Trends: Global Burden of Disease and Pharmaceutical Needs. 3rd ed. Geneva, Switzerland: WHO Press, World Health Organization; 2011. Available from: <http://www.apps.who.int/medicinedocs/documents/s20054en/s20054en.pdf>. [Last accessed on 2017 Jun 10].
 41. Singh PV, Tatambhotla A, Kalvakuntla R, Chokshi M. Understanding public drug procurement in India: A comparative qualitative study of five Indian states. *BMJ Open* 2013;3. pii: e001987.
 42. Tamil Nadu Medical Service Corporation (TNMSC). Drug Procurement Policy. Available from: <http://www.tnmisc.com/tnmsc/new/html/Procurement%20&%20Tender.php>. [Last accessed on 2017 Jun 10].
 43. National Health Mission, Haryana. Medicine Procurement Policy 2014. Department of Ayush Haryana, New Medicine Procurement Policy; 2014. Available from: <http://www.ayushharyana.gov.in/html/pdf/Medicine%20Procurement%20Policy%202014.pdf>. [Last accessed on 2017 Jun 10].
 44. Mandal SC, Mandal M. Improving use of medicines in the community through interventions for cost effective treatment. *Pharm Rev* 2013. p. 157-61.
 45. Kshirsagar MJ, Langade D, Patil S, Patki PS. Prescribing patterns among medical practitioners in Pune, India. *Bull World Health Organ* 1998;76:271-5.
 46. Mirza NY, Desai S, Ganguly B. Prescribing pattern in a pediatric out-patient department in Gujarat. *Bangladesh J Pharmacol* 2009;4:39-42.
 47. Maini R, Verma KK, Biswas NR, Agrawal SS. Drug utilization study in dermatology in a tertiary hospital in Delhi. *Indian J Physiol Pharmacol* 2002;46:107-10.
 48. Vijaykumar TM, Sathyavati D, Subhashini T, Sonika G, Dhanaraju MD. Assessment of prescribing trends and rationality of drug prescribing. *Int J Pharmacol* 2011;7:140-3.
 49. Salman MT, Akram MF, Rahman S, Khan FA, Haseen MA, Khan SW. Drug prescribing pattern in surgical wards of a teaching hospital in North India. *Indian J Pract Doct* 2008;5:5-8.
 50. Bharti SS, Shinde M, Nandeshwar S, Tiwari SC. Pattern of prescribing practices in the Madhya Pradesh, India. *Kathmandu Univ Med J* 2008;6:55-9.
 51. Pandey AA, Thakre SB, Bhatkule PR. Prescription analysis of pediatric outpatient practice in Nagpur city. *Indian J Community Med* 2010;35:70-3.
 52. Kotwani A, Ewen M, Dey D, Iyer S, Lakshmi PK, Patel A, *et al*. Prices & availability of common medicines at six sites in India using a standard methodology. *Indian J Med Res* 2007;125:645-54.
 53. Swain TR, Rath B, Dehury S, Tarai A, Das P, Samal R, *et al*. Pricing and availability of some essential child specific medicines in Odisha. *Indian J Pharmacol* 2015;47:496-501.
 54. Gitanjali B, Manikandan S. Availability of five essential medicines for children in public health facilities in India: A snapshot survey. *J Pharmacol Pharmacother* 2011;2:95-9.
 55. Bazargani YT, Ewen M, de Boer A, Leufkens HG, Mantel-Teeuwisse AK. Essential medicines are more available than other medicines around the globe. *PLoS One* 2014;9:e87576.
 56. Adikwu MU, Osondu BO. Four years of essential drugs' list in Nigeria. *Soc Sci Med* 1991;33:1005-10.
 57. Federal Ministry of Health, Nigeria. National Drug Formulary and Essential Drugs List Act. Decree 43 of 1989. 1st ed.; 1989. Available from: <http://www.placng.org/new/laws/N29.pdf>. [Last accessed on 2017 Jun 11].
 58. Federal Military Government of Nigeria. The Selection of Essential Drugs. National Drug Formulary and Essential Drugs Decree, p. A479; 1989.
 59. Federal Ministry of Health, Nigeria. Essential Medicines List. 5th ed.; 2010. Available from: <http://www.apps.who.int/medicinedocs/documents/s19018en/s19018en.pdf>. [Last accessed on 2017 Jun 11].
 60. World Health Organization (WHO). Essential Medicines and Health Products Information Portal. Essential Medicines List (Fifth Revision 2010) – Nigeria; 2017. Available from: <http://www.apps.who.int/medicinedocs/en/d/Js19018en/>. [Last accessed on 2017 Jun 11].
 61. Uzochukwu BS, Onwujekwe OE, Akpala CO. Did the Bamako initiative improve the utilization of maternal and child health-care services in Nigeria? A case study of Oji River Local Government Area in Southeast Nigeria. *J Health Popul Dev Ctries* 2004;9:1-18.
 62. Uzochukwu BS, Onwujekwe OE, Akpala CO. Effect of the Bamako-initiative drug revolving fund on availability and rational use of essential drugs in primary health care facilities in South-East Nigeria. *Health Policy Plan* 2002;17:378-83.
 63. Chukwuani CM, Olugboji A, Ugbene E. Improving access to essential drugs for rural communities in Nigeria: The Bamako initiative re-visited. *Pharm World Sci* 2006;28:91-5.
 64. Adebayo ET, Hussain NA. Pattern of prescription drug use in Nigerian army hospitals. *Ann Afr Med* 2010;9:152-8.
 65. Oyeyemi AS, Ogunleye OA. Rational use of medicines: Assessing progress using primary health centres in Shomolu local government area of Lagos, Nigeria. *West Afr J Med* 2013;32:121-5.

66. Abdu-Aguye SN, Haruna A, Shehu A, Labaran KS. An assessment of antimicrobial prescribing at a tertiary hospital in North-Western Nigeria. *Afr J Pharmacol Ther* 2016;5:229-34.
67. Babalola CP, Awoleye SA, Akinyemi JO, Kotila OA. Evaluation of prescription pattern in Osun State (Southwest) Nigeria. *J Public Health Epidemiol* 2011;3:94-8.
68. Tamuno I, Fadare JO. Drug prescription pattern in a Nigerian tertiary hospital. *Trop J Pharm Res* 2012;11:146-52.
69. Hassan A, Abdullahi GA, Ahmed AA, Sabiu A, John U, Ezekeil G, *et al.* Assessing prescriber's awareness of essential medicine list, hospital drug formulary and utilization of standard treatment guidelines in a tertiary healthcare facility in North-Central Nigeria. *Alexandria J Med* 2017 [In Press]. Available from: <http://www.sciencedirect.com/science/article/pii/S2090506816301221>. [Last accessed on 2017 Jun 11].
70. Ministry of Health, Republic of Kenya. Kenya Essential Drugs List, 2003. 3rd ed.; 2003. Available from: <http://www.apps.who.int/medicinedocs/documents/s16187e/s16187e.pdf>. [Last accessed on 2017 Jun 12].
71. Ministry of Medical and Ministry of Public Health, Republic of Kenya. Kenya Essential Drugs List; 2010. Available from: <http://www.apps.who.int/medicinedocs/documents/s18694en/s18694en.pdf>. [Last accessed on 2017 Jun 12].
72. Ministry of Health, Republic of Kenya. Kenya Essential Drugs List. 2016. Available from: <http://www.apps.who.int/medicinedocs/documents/s23035en/s23035en.pdf>. [Last accessed on 2017 Jun 12].
73. World Health Organization (WHO). Kenya: Updating the essential drugs list. *Essent Drugs Monit* 1993;16:16-7. Available from: <http://www.apps.who.int/medicinedocs/documents/s21135en/s21135en.pdf>. [Last accessed on 2017 Jun 12].
74. Marc L, Doherty J, Muchiri S, Barasa T, Hofler K, Maniscalco L, *et al.* Kenya Health System Assessment 2010. Bethesda, MD: Health Systems 20/20 Project, Abt Associates Inc.; 2010. Available from: <https://www.hfgproject.org/wp-content/uploads/2015/02/Kenya-Health-Systems-Assessment-2010.pdf>. [Last accessed on 2017 Jun 12].
75. IMS Institute for Healthcare Informatics. Understanding the Role and Use of Essential Medicines Lists; 2015. Available from: https://www.imshealth.com/files/web/IMSH%20Institute/Healthcare%20Briefs/IIHI_Essential_Medicines_Report_2015.pdf. [Last accessed on 2017 Jun 12].
76. Mecca LW, Riungu J, Guantai EM. Financing and availability of essential medicines before and after introduction of the national hospital insurance fund civil servants and disciplined services medical scheme at Webuye district hospital, Kenya. *Afr J Pharmacol Ther* 2014;3:128-33.
77. Wangu MM, Osuga BO. Availability of essential medicines in public hospitals: A study of selected public hospitals in Nakuru County, Kenya. *Afr J Pharm Pharmacol* 2014;8:438-42.
78. Mecca LW. Financing and Availability of Essential Medicines before and after Introduction of the National Hospital Insurance Fund Civil Servants and Disciplined Services Medical Scheme: A Case Study of Webuye District Hospital, Western Kenya. Master's Thesis, Department of Pharmacology and Pharmacognosy, University of Nairobi; 2014. Available from: http://www.pharm-school.uonbi.ac.ke/sites/default/files/chs/pharmschool/pharmschool/THESIS_MECCA.pdf. [Last accessed on 2017 Jun 13].
79. Agwanda RO, Kwamanga DO, Kiugu SK. Essential drugs supply and usage as a reflection of outpatient morbidity in Kirinyaga district, Kenya. *East Afr Med J* 1996;73:120-5.
80. Ordinance No. 2.981 of November 26, 2009. Approves the Specialized Component of Pharmaceutical Assistance. Brasília, Brazil: Official Federal Gazette, Ministry of Health; 2009.
81. Leitão LC, da Silva PC, Simões AE, Barbosa IC, Pinto ME, da Silva Simões MO. Analysis of medicine procurement lawsuits in the state of Paraíba, Brazil. *Saúde Soc* 2016;25:800-7.
82. Naves Jde O, Silver LD. Evaluation of pharmaceutical assistance in public primary care in Brasília, Brazil. *Rev Saúde Pública* 2005;39:223-30.
83. Portaria No. 3916 (National Medicines Policy). Federal Official Gazette. Brasília, Brazil: National Press, Ministry of Health; 1998.
84. Yunes J. Promoting Essential Drugs, Rational Drug Use and Generics: Brazil's National Drug Policy Leads the Way. *Essential Drug Monitor*. Vol. 27. Geneva, Switzerland: World Health Organization CH-1211; 1999. p. 22-3. Available from: <http://www.apps.who.int/medicinedocs/pdf/h1467e/h1467e.pdf>. [Last accessed on 2017 Jun 14].
85. Nóbrega Ode T, Marques AR, de Araújo AC, Karnikowski MG, Naves Jde O, Silver LD, *et al.* Retail prices of essential drugs in Brazil: An international comparison. *Rev Panam Salud Publica* 2007;22:118-23.
86. Karnikowski MG, Nóbrega OT, Naves JO, Silver LD. Access to essential drugs in 11 Brazilian cities: A community-based evaluation and action method. *J Public Health Policy* 2004;25:288-98.
87. Bertoldi AD, Helfer AP, Camargo AL, Tavares NU, Kanavos P. Medicine Prices, Availability and Affordability in Southern Brazil: A Study of Public and Private Facilities; 2010. Available from: <http://www.eprints.lse.ac.uk/28864/1/WP18.pdf>. [Last accessed on 2017 Jun 20].
88. Guerra AA Jr, Acúrcio Fde A, Gomes CA, Miralles M, Girardi SN, Werneck GA, *et al.* Availability of essential drugs in two regions of Minas Gerais, Brazil. *Rev Panam Salud Publica* 2004;15:168-75.
89. Coelho HL, Rey LC, Medeiros MS, Barbosa RA, Cruz Fonseca SG, Costa PQ, *et al.* A critical comparison between the World Health Organization list of essential medicines for children and the Brazilian list of essential medicines (Rename). *J Pediatr (Rio J)* 2013;89:171-8.
90. Ministério da Saúde. Secretaria de Ciência, Tecnologia e Insumos Estratégicos. Departamento de Assistência Farmacêutica e Insumos Estratégicos. Relação Nacional de Medicamentos Essenciais Rename 2010. Série B. Textos Básicos de Saúde 7a edição Brasília – DF; 2010. Available from: http://www.who.int/selection_medicines/country_lists/Brazil_rename2010.pdf?ua=1. [Last accessed on 2017 Jun 14].
91. Bertoldi AD, Helfer AP, Camargo AL, Tavares NU, Kanavos P. Is the Brazilian pharmaceutical policy ensuring population access to essential medicines? *Global Health* 2012;8:6.
92. Fundação Oswaldo Cruz. Programa Farmácia Popular do Brasil: Manual Básico. In Book Ministério da Saúde. Fundação Oswaldo Cruz. Programa Farmácia Popular do Brasil: Manual Básico. Brasília-DF, Brazil: Editora do Ministério da Saúde; 2005. p. 102.
93. Nogueira FH, Moreira-Campos LM, Santos RL, Pianetti GA. Quality of essential drugs in tropical countries: Evaluation of antimalarial drugs in the Brazilian health system. *Rev Soc Bras Med Trop* 2011;44:582-6.
94. Watal J. Workshop on Differential Pricing and Financing of Essential Drugs. The WTO Secretariat. Available from: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&cad=rja&uact=8&ved=0ahUKewj0bbL1LzUAhWBO48KHUEsBYwQIAhIMAQ&url=https%3A%2F%2Fwebcache.googleusercontent.com%2Fsearch%3Fq%3Dcache%3A2Cj0IFJdQZIJ%3Ahttps%3A%2F%2Fwww.wto.org%2Fenglish%2Ftratop_e%2Ftrips_e%2Fwto_background_e.doc%2B%26cd%3D5%26hl%3Den%26ct%3Dclnk&usq=AFQjCNHoqLF8Y53-9fjmb5A1bvUVm1v4mw&sig2=b9dib--LvU7azJduofEvTw. [Last accessed on 2017 Jun 14].
95. Spatz ID. Health reform accelerates changes in the pharmaceutical industry. *Health Aff (Millwood)* 2010;29:1331-6.
96. Laing R, Waning B, Gray A, Ford N, 't Hoen E. 25 years of the WHO essential medicines lists: Progress and challenges. *Lancet*

- 2003;361:1723-9.
97. Abraham J, Davis C. A comparative analysis of drug safety withdrawals in the UK and the US (1971–1992): Implications for current regulatory thinking and policy. *Soc Sci Med* 2005;61:881-92.
 98. Anonymous. A look back at 2009; one step forward, two steps back. *Prescriber Int* 2010;106:89-94.
 99. Baena Díez JM, del Val García JL, Alemany Vilches L, Deixens Martínez B, Amatller Corominas M, Núñez Casillas DK. Analysis of the new active principles sold in Spain (1992–2002). *Aten Primaria* 2005;36:378-84.
 100. Rico-Alba I, Figueras A. The fuzzy line between needs, coverage, and excess in the Mexican formulary list: An example of qualitative market width analysis. *Eur J Clin Pharmacol* 2013;69:949-56.
 101. Pehudoff SK, Laing RO, Hogerzeil HV. Access to essential medicines in national constitutions. *Bull World Health Organ* 2010;88:800.
 102. Gallala-Armdt I. Constitutional Reforms in Tunisia, Egypt, Morocco and Jordan: A Comparative Assessment. Governance and New Political Actors; 01-05, 2012. Available from: http://www.iemed.org/observatori-en/arees-danalisi/arxiu-adjunts/anuari/med.2012/gallala_en.pdf. [Last accessed on 2017 Jun 14].
 103. Katrina Pehudoff S, Toebes B, Hogerzeil H. Essential medicines in national constitutions: Progress since 2008. *Health Hum Rights* 2016;18:141-56.
 104. Rivas R. PHP17 Mexico's national and institutional essential medicine lists. *Value Health* 2011;14:A551.
 105. Quintiles IMS Institute. Ensuring Essential Medicines Satisfy Priority Healthcare Needs of Populations. Evolution, Current State and Future Needs. Parsippany, NJ, USA; 2016. Available from: <https://www.ifpma.org/wp-content/uploads/2016/11/2016-QuintilesIMS.pdf>. [Last accessed on 2017 Jun 14].
 106. Hayden C. A generic solution? Pharmaceuticals and the politics of the similar in Mexico. *Curr Anthropol* 2007;48:475-95.
 107. Ministry of Health and Population, Department of Drug Administration, Government of Nepal, National List of Essential Medicines Nepal. 4th Revision; 2009. Available from: http://www.who.int/selection_medicines/country_lists/npl_eml_.pdf. [Last accessed on 2017 Jun 16].
 108. Ministry of Health and Population, Department of Drug Administration, Government of Nepal, National List of Essential Medicines Nepal. 4th Revision; 2009. Available from: http://www.searo.who.int/entity/medicines/neml_nep_2011_govtwebsite_ok.pdf?ua=1. [Last accessed on 2017 Jun 16].
 109. Prasai DP. A Review of Studies on Nepal's National Free Health Care Programme. Kathmandu, Nepal: Department of Health Services, Ministry of Health and Population; 2013. Available from: http://www.nhssp.org.np/gesi/Free_care_review_november2013.pdf. [Last accessed on 2017 Jun 16].
 110. World Health Organization (WHO). Medicines in Health Care Delivery Nepal: Situational Analysis 2014. Report Prepared Using the WHO/SEARO Workbook Tool for Undertaking a Situational Analysis of Medicines in Health Care Delivery in Low and Middle Income Countries; 2015. Available from: <http://www.searo.who.int/entity/medicines/nepal2014.pdf>. [Last accessed on 2017 Jun 16].
 111. Ranjit E. Pharmacy practice in Nepal. *Can J Hosp Pharm* 2016;69:493-500.
 112. Khan GM, Thapa RK, Adhikari DS, Rajbhandari M, Dwa P, Shrestha S, *et al.* Evaluation of cancer prevalence and cytotoxic medication prescribing in central region of Nepal. *Kathmandu Univ J Sci Eng Technol* 2013;9:189-99.
 113. Shankar RP, Pranab KS, Upadhyay DK, Dubey AK, Subish P. Drug utilization among surgical outpatients. *TMJ* 2006;56:2-3.
 114. Ghimire S, Nepal S, Bhandari S, Nepal P, Palaian S. Students' corner-a prospective surveillance of drug prescribing and dispensing in a teaching hospital in Western Nepal. *J Pak Med Assoc* 2009;59:726-31.
 115. Dahal P, Bhattarai B, Adhikari D, Shrestha R, Baral SR, Shrestha N. Drug use pattern in primary health care facilities of Kaski District, Western Nepal. *Sunsari Tech Coll J* 2012;1:1-8.
 116. Ghosh R, Neogi JN, Srivastava BS, Sen P. Prescribing trends in a teaching hospital in Nepal. *J Nepal Med Assoc* 2003;42:346-9.
 117. Upadhyay DK, Palaian S, Shankar PR, Mishra P. Rational drug prescribing and dispensing in tertiary care teaching hospital of Western Nepal. *J Inst Med* 2008;30:33-8.
 118. Alam K, Mishra P, Prabhu M, Shankar PR, Palaian S, Bhandari RB, *et al.* A study on rational drug prescribing and dispensing in outpatients in a tertiary care teaching hospital of Western Nepal. *Kathmandu Univ Med J* 2006;4:436-43.
 119. Karande S, Sankhe P, Kulkarni M. Patterns of prescription and drug dispensing. *Indian J Pediatr* 2005;72:117-21.
 120. Shankar PR, Upadhyay DK, Subish P, Dubey AK, Mishra P. Prescribing patterns among pediatric inpatients in a teaching hospital in western Nepal. *Singapore Med J* 2006;47:261-5.
 121. Food, Medicine and Healthcare Administration and Control Authority of Ethiopia. National Essential Medicine List. 5th ed. Addis Ababa; 2014. Available from: <http://www.apps.who.int/medicinedocs/documents/s22351en/s22351en.pdf>. [Last accessed on 2017 Jun 17].
 122. Food, Medicine and Healthcare Administration and Control Authority of Ethiopia. List of Medicines for Ethiopia. 6th ed. Addis Ababa; 2010. Available from: <http://www.apps.who.int/medicinedocs/documents/s17816en/s17816en.pdf>. [Last accessed on 2017 Jun 17].
 123. Sado E, Sufa A. Availability and affordability of essential medicines for children in the western part of Ethiopia: Implication for access. *BMC Pediatr* 2016;16:40.
 124. Carasso BS, Lagarde M, Tesfaye A, Palmer N. Availability of essential medicines in Ethiopia: An efficiency-equity trade-off? *Trop Med Int Health* 2009;14:1394-400.
 125. Abiye Z, Tesfaye A, Hawaze S. Barriers to access: Availability and affordability of essential drugs in a retail outlet of a public health center in South Western Ethiopia. *J Appl Pharm Sci* 2013;3:101-5.
 126. Bilal AI, Osman ED, Mulugeta A. Assessment of medicines use pattern using World Health Organization's prescribing, patient care and health facility indicators in selected health facilities in Eastern Ethiopia. *BMC Health Serv Res* 2016;16:144.
 127. Kebede M, Borg DK, Bobasa EM. Drug utilization in selected health facilities of South West Shoa Zone, Oromia region, Ethiopia. *Drug Healthc Patient Saf* 2015;7:121-7.
 128. Lindtjorn B. Essential drug list in a rural hospital. Does it have any influence on drug prescription? *Trop Doct* 1987;17:151-5.
 129. Gidebo KD, Summoro TS, Kanche ZZ, Woticha EW. Assessment of drug use patterns in terms of the WHO patient-care and facility indicators at four hospitals in Southern Ethiopia: A cross-sectional study. *BMC Health Serv Res* 2016;16:643.
 130. Desalegn AA. Assessment of drug use pattern using WHO prescribing indicators at Hawassa university teaching and referral hospital, South Ethiopia: A cross-sectional study. *BMC Health Serv Res* 2013;13:170.
 131. Ministry of Health, Malaysia. Malaysian National Medicines Policy. 2nd ed.; 2012. Available from: <http://www.apps.who.int/medicinedocs/documents/s22203en/s22203en.pdf>. [Last accessed on 2017 Jun 17].
 132. Razak ZA. National Essential Drug List Hailed. *New Straits Times*; 1996. Available from: http://www.prn.usm.my/old_website/sites/nedl.html. [Last accessed on 2017 Jun 17].
 133. Ministry of Health, Malaysia. National Essential Medicines List.

- 4th ed.; 2014. Available from: <http://www.apps.who.int/medicinedocs/documents/s23090en/s23090en.pdf>. [Last accessed on 2017 Jun 17].
134. Roughead EE, Lhazeen K, Socialine E, Bahri S, Park BJ, Holloway K, *et al.* Monitoring medicines use to support national medicines policy development and implementation in the Asia pacific region. *WHO South East Asia J Public Health* 2013;2:113-7.
 135. Ministry of Health Malaysia, Malaysian Statistics on Medicines 2009 & 2010. A Publication of the Pharmaceutical Services Division and the Clinical Research Centre, Ministry of Health, Lot 36, Jalan Universiti 46350 Petaling Jaya, Malaysia; 2014. Available from: http://www.pharmacy.gov.my/v2/sites/default/files/document-upload/Malaysian-statistics-medicines-2009-2010_0.pdf. [Last accessed on 2017 Jun 17].
 136. Babar ZU, Ibrahim MI, Singh H, Bukahri NI, Creese A. Evaluating drug prices, availability, affordability, and price components: Implications for access to drugs in Malaysia. *PLoS Med* 2007;4:e82.
 137. Saleh K, Ibrahim MI. Are essential medicines in Malaysia accessible, affordable and available? *Pharm World Sci* 2005;27:442-6.
 138. Brudon P, Rainhorn JD, Reich MR. Indicators for Monitoring National Medicine Policies. WHO/EDM/PAR/99.3. 2nd ed. Geneva: World Health Organization; 1999. Available from: <http://www.apps.who.int/medicinedocs/pdf/whozip14e/whozip14e.pdf>. [Last accessed on 2017 Jun 18].
 139. Sarojini S, Faridah A, Lim CM, Sameerah SA, Lim TO, Lai LS, *et al.* Use of prescription medicines in Malaysia 2005. *Med J Malaysia* 2008;63:203-6.
 140. Saleh K, Ibrahim MI. How rational are drugs used in Malaysian primary health care sector? *Malaya J Pharm Sci* 2006;4:1-12.
 141. Ahmed H, Ibrahim MI, Babar ZU. Affordability of Essential Medicines Used for Treating Chronic Diseases in Malaysia: An Academic Perspective. *Internet J Third World Med* 2008;8:1-10. Available from: <http://www.ispub.com/IJTWM/8/1/4197>. [Last accessed on 2017 Jun 18].
 142. Babar ZU, Ibrahim MI, Bukhari NI. Medicine utilization and pricing in Malaysia: The findings of a household survey. *J Generic Med* 2005;3:41-61.
 143. Babar ZD, Izham MI. Effect of privatization of the drug distribution system on drug prices in Malaysia. *Public Health* 2009;123:523-33.
 144. Fatokun O, Ibrahim MI, Hassali MA. Generic competition and drug prices in the Malaysian off-patent pharmaceutical market. *J Appl Pharm Sci* 2011;1:33-7.
 145. Perumal-Pillay VA, Suleman F. Quantitative evaluation of essential medicines lists: The South African case study. *BMC Health Serv Res* 2016;16:687.
 146. Quick JD, Hogerzeil HV, Velasquez G, Rago L. Twenty-five years of essential medicines. *Bull World Health Organ* 2002;80:913-4.
 147. Department of Health, Republic of South Africa. Essential Drugs Programme (EDP). Available from: <http://www.health.gov.za/index.php/essential-drugs-programme-edp>. [Last accessed on 2017 Jun 19].
 148. South African National Department of Health. National Drug Policy for South Africa; 1996. Available from: <http://www.apps.who.int/medicinedocs/documents/s17744en/s17744en.pdf>. [Last accessed on 2017 Jun 19].
 149. Coovadia H, Jewkes R, Barron P, Sanders D, McIntyre D. The health and health system of South Africa: Historical roots of current public health challenges. *Lancet* 2009;374:817-34.
 150. Perumal-Pillay VA, Suleman F. Selection of essential medicines for South Africa – An analysis of in-depth interviews with national essential medicines list committee members. *BMC Health Serv Res* 2017;17:17.
 151. Sooruth UR, Sibiya MN, Sokhela DG. The use of standard treatment guidelines and essential medicines list by professional nurses at primary healthcare clinics in the Umgungundlovu district in South Africa. *Int J Afr Nurs Sci* 2015;3:50-5.
 152. Peters DH, Garg A, Bloom G, Walker DG, Brieger WR, Rahman MH. Poverty and access to health care in developing countries. *Ann NY Acad Sci* 2008;1136:161-71.
 153. Bansal D, Purohit VK. Accessibility and use of essential medicines in health care: Current progress and challenges in India. *J Pharmacol Pharmacother* 2013;4:13-8.
 154. Holloway KA, Henry D. WHO essential medicines policies and use in developing and transitional countries: An analysis of reported policy implementation and medicines use surveys. *PLoS Med* 2014;11:e1001724.
 155. Leisinger KM, Garabedian LF, Wagner AK. Improving access to medicines in low and middle income countries: Corporate responsibilities in context. *South Med Rev* 2012;5:3-8.
 156. Sridhar D. Improving access to essential medicines: How health concerns can be prioritized in the global governance system. *Public Health Ethics* 2008;1:83-8.