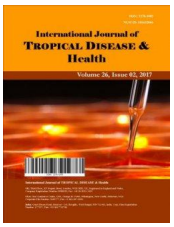

International Journal of TROPICAL DISEASE & Health

30(4): 1-8, 2018; Article no.IJTDH.39854
ISSN: 2278–1005, NLM ID: 101632866

Health Managers' Knowledge of Essential Drugs and the Availability of Essential Drugs in Primary Health Care Centres in Sokoto, Northwest Nigeria

L. A. Jamil[1*], M. T. O. Ibrahim[2], B. A. Isah[2], A. Chika[1], K. J. Awosan[2] and A. Mohammed[3]

[1]Department of Pharmacology & Therapeutics, Faculty of Basic Clinical Sciences, College of Health Sciences, Usmanu Danfodiyo University, Sokoto State, Nigeria.
[2]Department of Community Health, Faculty of Clinical Sciences, College of Health Sciences, Usmanu Danfodiyo University, Sokoto State, Nigeria.
[3]Department of Radiography, Faculty of Clinical Sciences, College of Health Sciences, Usmanu Danfodiyo University, Sokoto State, Nigeria.

Authors' contributions

This work was carried out in collaboration between all authors. Authors LAJ and MTOI designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors BAI and AC managed the analyses of the study. Authors KJA and AM managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJTDH/2018/39854
Editor(s):
(1) Zhiheng Zhou, Thyroid Cancer Research Laboratory, Massachusetts General Hospital, Harvard Medical School, Boston, USA.
Reviewers:
(1) Bobby Joseph, St. John's Medical College, India.
(2) Mohan A. Sunkad, Universiti Sains Malaysia, Malaysia.
Complete Peer review History: http://www.sciencedomain.org/review-history/24942

Original Research Article

Received 25th December 2017
Accepted 3rd March 2018
Published 2nd June 2018

ABSTRACT

Background: The significant indicator to access to effective treatment is the constant availability of essential drugs in health facilities and the accessibility to essential drugs is part of the fulfilment of the right to the highest attainable standard of health, that is, the right to health. There is compelling evidence of reduced availability of essential drugs which poses a significant barrier to access to medicines.
Objective: To determine the knowledge of essential drugs by health managers and the availability of essential drugs in primary health care (PHC) centres in Sokoto state, North-Western Nigeria.

**Corresponding author: Email: jameeeldoc@gmail.com;*

Methodology: The study population comprised of selected Primary Health Care Centres and their supervisory managers across Sokoto state. The study was cross-sectional and descriptive.
Results: Sixty-six primary health care managers and their corresponding health facilities participated in the study. The mean age of the health managers was 43 years with 46 females and 20 males. This study found mean availability of essential drugs in the primary health care centres with 57.5% having adequate essential drugs, the knowledge of essential drugs among the primary health care facility managers was poor and the knowledge has a significant effect on the availability of essential drugs ($p<0.001$).
Conclusion: Poor knowledge on essential drugs and its management by the Primary Health Facility Managers was a major contributing factor to the availability of essential drugs in the PHCs which consequently affects health service delivery at the health facilities. Training and re-training of primary health care managers on essential drugs and its management by the Sokoto state government through the State Primary Health Care Development Agency (SPHCDA) are recommended.

Keywords: Availability; essential drugs; health managers; knowledge; primary health care.

1. INTRODUCTION

"Management is the act or art of being responsible or in charge and conducting or supervising something (e.g. a health center pharmacy) with a degree of skill and address. It is the judicious use of means to accomplish an end (i.e. public health)" [1]. "Management can also refer to the collective body of those who are responsible for an entity (e.g. a health Centre) or who exercise executive, administrative supervisory and regulatory control (e.g. board of governors, village health committee)" [1]. Anybody responsible for supervising the administration or regulating the functions and activities of a Primary Health Care Centre can be refer to as “Health Facility Manager” and such person is part of the Primary Health Care team. The PHC manager can be a Medical Officer, Pharmacist, Community Health Officer (CHO), Community Health Extension worker (CHEW) or Senior Community Health Extension worker (SCHEW) [2].

There is a strong need to manage drugs properly and adequately because drugs serve as a linkage between the patient and health services. Consequently, their availability or absence will contribute to positive or negative impact on health [1,3]. It is said that the major indicator to access to effective treatment is the constant availability of essential drugs in primary health care centers [4] and the accessibility to essential drugs is part of the fulfilment of the right to the highest attainable standard of health, that is, the right to health [5]. There is compelling evidence of inadequate availability of essential drugs which possess a significant barrier to access to medicines [4]and the availability of generic medicines is less than 60% across WHO regions in public health facilities. According to a report, there were inadequate and trained health care workers on management of essential drugs [6] and the inefficient management of essential drugs represents a significant financial burden for the health system and untold hardship on the community members with resultant poor utilization of health services and increase in morbidities and mortalities [7].

Most of the leading causes of death and disability in the developing countries can be prevented, treated or better still alleviated with the use of cost-effective essential drugs [8]. But unfortunately, hundreds of millions of people do not have access to essential drugs regularly. However, even most of those who have access are given the wrong treatment, receive too little drug for their illness, or do not use the drug correctly [9]. Mortality figures in developing countries showed a huge burden of illness that can be substantially reduced if carefully selected, low-cost essential drugs are available and appropriately utilized [10]. Essential drugs have a significant impact on common causes of morbidity and mortality, including acute respiratory tract infection (ARI), measles, diarrheal diseases, malaria, sexually transmitted diseases (STDs), tuberculosis, maternal and perinatal mortality, peptic ulcer disease and cardiovascular and other chronic diseases [11].

It is in realization of the role availability of essential drugs plays in improving the health outcome of the people that it becomes imperative to carry out this research to ascertain the gap in knowledge of essential drugs by the health

facility managers and the availability of essential drugs in the health facilities.

The objective of the study was to determine the knowledge of essential drugs by health managers and the availability of essential drugs in Primary Health Care (PHC) centres in Sokoto state, North-West Nigeria.

2. MATERIALS AND METHODOLOGY

2.1 Study Design

It was a cross-sectional and descriptive study.

2.2 Study Population

Primary Health Care Centres and Managers of the Health facilities in Sokoto State, North-West Nigeria.

2.3 Selection of Participants

2.3.1 Inclusion criteria

All Primary Health Centres and Health Facility Managers in Sokoto state that worked for at least six (6) month at the Centre were eligible to participate in the study.

2.3.2 Exclusion criteria

Tertiary and general hospitals as well as dispensaries were excluded from the study.

2.4 Sampling Technique

2.4.1 Sample size

Assuming the prevalence rate of PHC Managers with good knowledge of essential drugs is 50%, the minimum sample size is 70, at standard normal deviate for confidence limit of 95% and precision of 5%, that is, tolerable alpha error of 0.05 [12].

2.4.2 Cluster random sampling technique

The eligible respondents and their PHCs were selected by cluster random sampling technique.
Pre-sampling phase: A list of all the primary health centers in Sokoto State was obtained from the State Ministry of Health Sokoto.

Stage 1: Sokoto State was divided into three clusters (senatorial zones). Namely; Sokoto East, Sokoto South and Sokoto North senatorial zones

Stage 2: Then one cluster (Sokoto South senatorial zone) was selected randomly from the three clusters (senatorial zones).

Stage 3: All the PHCs and their Managers in the selected Sokoto South Senatorial zone were recruited into the study.

2.5 Data Collection

2.5.1 Method of data collection

Data was collected by direct observational check list and questionnaire.

2.5.2 Instruments of data collection

The instrument of data collection included a structured observation check-list used in assessing the availability of essential drugs in the Primary Health facilities which was adapted from the federal Government of Nigeria essential medicines list 2010 [13]. A self-administered semi-structured questionnaire was used to obtain information of health managers' socio-demographic profiles, knowledge of essential drugs in the health facilities.

2.6 Statistical Analysis

Data collation and sorting was done manually for completeness and accuracy. Computer data processing was done using Statistical Package for Social Sciences (SPSS) version 21 software and Microsoft Excel 2010. The choice of statistical test was guided by the normality of the data distribution. Normally distributed data were summarized using mean and standard deviations, while proportions and percentages were used to summarize categorical data. Frequency runs were done further for e-data check and cleaning to identify and address missed entries. Description of the availability of essential drugs in the study facility was based on the following ranges [14].

1. <30% Very low
2. 30-49% Low
3. 50-79% Fairly high
4. >80% High

Availability of each drug will be calculated as percentage (%) of health facilities in which the drug was found on the day of data collection [15].

2.7 Ethical Considerations

Ethical approval was sought from the Ethics and Research Committee of the Ministry of Health, Sokoto State, Nigeria (SKHREC/009/015). Written informed consent was obtained from each study participant. Utmost confidentiality of identity of participant was maintained in the analysis and subsequent write- up.

3. RESULTS AND DISCUSSION

During the survey, seventy (70) questionnaires were administered to the respondents, 66 (94%) were filled, returned and analyzed after validation. The health managers were essentially similar socio-demographically and majority of the respondents were in the fourth decade of life. The largest proportion (66.7%) were in the 41-50 years' age group, followed by 22.7% in the 31-40 years' age group and only 5.6% in the 51-60 years' age group. Fifteen respondents comprising 4 males and 11 females, 44 respondents comprising 14 males and 30 females and 7 respondents comprising 2 males and 5 females in the age groups 30-40, 41-50 and 51-60 years respectively (Table 1).

Most of the health managers fall within the age group of 41-50 years but all those in the age group 51 - 60 years had had good knowledge of essential drugs and adequate availability of essential drugs in their health facilities.

The health managers generally had poor depth of knowledge of essential drugs. The mean knowledge score for the knowledge of essential drugs was 36.44%. About 42.4% of the health managers had good knowledge while the remaining 57.6% had poor knowledge of essential drugs.

Looking at the different components of knowledge of essential drugs, only about 16.7% knew the correct definition of essential drugs and 83.3% did not know the meaning. Interestingly, more than 75% of the health managers did not know the Pull and Push system of drug supply to the health facilities and only 48.5% of the health managers knew the criteria for the selection of essential drugs. On the other hand, half of the health facility managers knew First in First Out (FIFO) while First to Expire First Out (FEFO) concepts was known by 45.5%. Only 18.2% knew what inventory control system is while the remaining had no knowledge on inventory control system and similarly only 28.8% were knowledgeable about the types of the inventory control system (Table 3).

Regarding steps in the management of essential drugs, majority of the health managers (71.2%) admitted to dispensing of drugs, 66.7% storage and distribution of drugs, 48.5% selection of drugs and 47.0% admitted to procurement of drugs as the steps in the management of essential drugs. But a divergent finding was obtained from a study in Brazil which found weaknesses in local selection procedures and in the use of the National essential medicines lists [16]. Similarly, another study in Guyana and Brazil found weaknesses in the selection process of essential drugs [16,17].

Table 1. Socio-demographic characteristics of health facility managers

Characteristics	Number (%)
Age group	
31-40	15 (22.7)
41-50	44 (66.7)
51-60	7 (10.6)
Mean age 43.1 ± 7.1	
Sex	
Male	20 (30.3)
Female	46 (69.7)
Marital status	
Married	66 (100.0)
Qualification	
Community Health Officer	39 (59.1)
Community Health Extension	16 (24.2)
Worker	11 (16.7)
Senior Community Health Extension Worker	
Rank	
In-charge	60 (90.9)
Acting in-charge	6 (9.1)
Years in service	
1-10	8 (12.1)
11-20	28 (42.4)
21-30	30 (45.5)
Mean years (19.52 ±6.44 years)	

About 58% of the primary health care centres had average availability of essential drugs while the remaining 42% had poor availability of essential drugs (Fig. 1). The average availability of the basket of drugs was 51.98% in all the PHCs. This finding was higher than mean availability of 48.8% obtained in a study in Delhi [18], Malaysia 40% [19] and China 38.9% [20]. But this finding was far below the mean

availability of 91% in Ethiopia [21], 82.5% in Sudan [22] and 68% in Swaziland [23]. The drugs with a very high availability includes Artemether + Lumefantrine (ACT) tablets, paracetamol tablets, oral rehydration salts (ORS), Amoxicillin capsule/caplet, Metronidazole tablet and Ferrous salts/folic acids oral tablets (Table 2). This finding was slightly below what was obtained in a study conducted in Ethiopia where Artemether + Lumefantrine (ACT) both for adult and child were 100% available [21] but an improvement when compared with a study conducted in North Central Nigeria with poor availability of essential drugs where only paracetamol tablets and syrup were available in sufficient quantities in all the three PHCs surveyed in Tafa LGA[24], in Burkina Faso where zero availability for Artemether + Lumefantrine tablets [25] was found but availability of ORS was found to be 80% in Ethiopia [21] and 55.6% in Tanzania [26].

The knowledge of essential drugs by those responsible for the day to day running of the primary health care facilities is very crucial as this current study found that the knowledge of health facility managers have significant effects on the availability of essential drugs in the health facilities ($p<0.001$) (Table 4).

Community Health Officer (CHO) are trained to be the most senior of the community health workers in Nigeria. Thirty percent of their time is spent in the community while remaining 70% spent in the clinic. They are trained to have administrative, medical, training and supervisory responsibilities for the primary health care centres. Community Health Extension Worker (CHEW) are health workers with specialized training in providing primary health care in Nigeria. Their duties are limited to consultation,

Table 2. Availability of selected essential drugs in the primary health centers

Class of drugs	Drugs	Frequency (%)
Analgesics	Acetylsalicylic acid	27 (40.9)
	Paracetamol oral liquid	36 (54.5)
	Paracetamol oral tablets	58 (87.9)
Anti-convulsants	Diazepam tablets	7 (10.6)
	Paraldehyde injection	3 (4.5)
Anti-infective	Co-trimoxazole oral suspension	44 (66.7)
	Co-trimoxazole tablets	37 (56.1)
	Amoxicillin capsule (caplets)	53 (80.3)
	Amoxicillin oral suspension	34 (51.5)
	Metronidazole tablets	53 (80.3)
	Metronidazole oral suspension	36 (54.5)
Anti-malarial	Artemether Lumefantrine (ACT) tablet	60 (90.9)
	Artemether + Lumefantrine (ACT) oral suspension	0 (0.00)
	Pyrimethamine + Sulfadoxine oral suspension	0 (0.00)
	Pyrimethamine + Sulfadoxine tablets	47 (71.2)
	Quinine tablets	0 (0.00)
Antiseptics	Chlorhexidine/iodine/methylated spirit	47 (71.2)
Hematinic	Ferrous salts/folic acid oral liquid	3 (4.5)
	Ferrous salts/folic acid oral tablets	55 (83.3)
GIT	Oral rehydration salts (ORS)	56 (84.8)
	Zinc tablets	45 (68.2)
	Zinc oral liquid	0 (0.00)
Hormones & Synthetics substitutes	Condoms	48 (72.7)
	Oral contraceptives	44 (66.7)
Immunological	Anti-snake bite serum	0 (0.00)
	Measles vaccines	21 (31.8)
	Tetanus vaccines	29 (43.9)
Ophthalmological	Chloramphenicol eye drops/ointments	45 (68.2)
Oxytocic	Ergometrine injection	17 (25.8)
Psychotherapeutic drugs	Chlorpromazine tablets	0 (0.00)
Respiratory drug	Salbutamol inhaler	2 (3.0)

Gastrointestinal tract (GIT), Oral rehydration salts (ORS)

Table 3. Health managers' knowledge of essential drugs

Variables	Correct N (%)	Incorrect N (%)
Meaning of essential drugs	11 (16.7)	55 (83.3)
Meaning of management of essential drugs	4 (6.1)	62 (93.9)
Criteria for the selection of essentials	32 (48.5)	34 (51.5)
Meaning of Push system of drug supply	16 (24.2)	50 (75.8)
Meaning of Pull system of drug supply	16 (24.2)	50 (75.8)
Meaning of request indicator	15 (22.7)	51 (77.3)
Meaning of First in First Out	33 (50.0)	33 (50.0)
Meaning of First to Expire First Out	30 (45.5)	36 (54.5)
Meaning of Inventory control system	12 (18.2)	54 (81.8)
Types of Inventory control system	19 (28.8)	47 (71.2)

The respondents' level of knowledge of essential drugs and its management. The mean knowledge score of health manager's knowledge of essential drugs and its management was 36.44%

Table 4. Effect of knowledge of essential drugs on the availability of essential drugs

Variable	Level of availability of essential drugs		χ^2	Df	P - value
Knowledge of essential drugs & its management	**Adequate frequency (%)**	**Inadequate frequency (%)**			
Good	24 (85.7)	4 (14.3)			
Poor	10 (26.3)	28 (73.7)	22.79	1	0.001

The knowledge of essential drugs and its management were significantly associated with the level of availability of essential drugs in the PHCs (p<0.001)

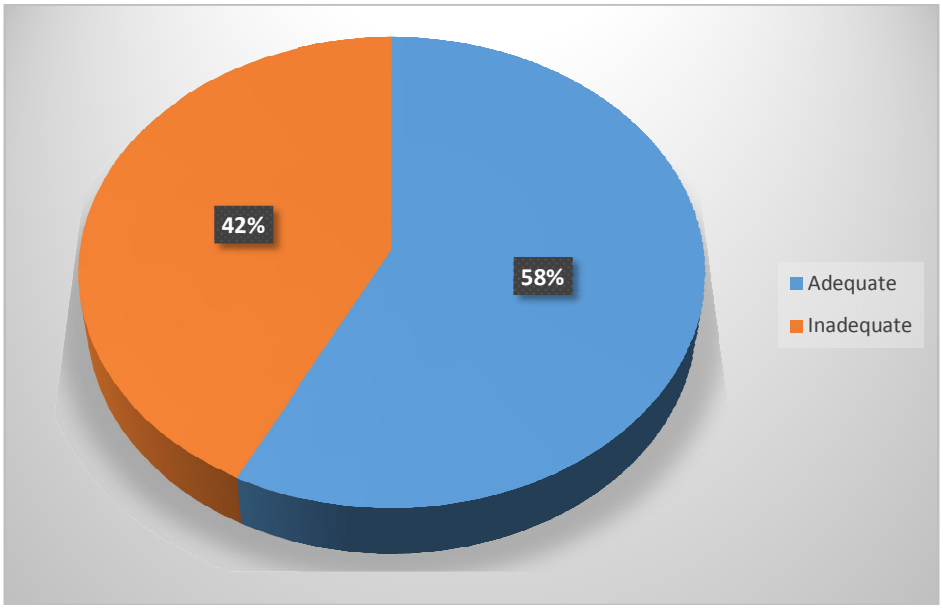

Fig 1. Percentage of health facilities with adequate and inadequate essential drugs
Thirty-Eight Primary Health Facilities representing 58% had adequate essential drugs

prescription writing, basic treatment and conducting minor procedures, all done by adhering to the standing orders [27].

The age range of the respondents was from 45-50 years (mean age 43.11; SD = 7.11) and the female gender was the dominant (69.7%).

3.1 Availability of Some Selected Essential Drugs

The mean percentage shelf availability of essential drugs in all the primary health care facilities was 51.98%. The analgesic, anti-infective, anti-malarial and hematinic with very high availability were paracetamol tablet, amoxicillin capsule and metronidazole tablet, artemether + Lumefantrine tablet and ferrous salts/folic acid.

4. CONCLUSION

Poor knowledge of essential drugs and its management by the Primary Health Facility Managers was a major contributing factor to the availability of essential drugs in the PHCs which consequently affects health service delivery at the health facilities and by extension health services utilization by the community members and the system of drug supply to the health facilities also play significant effect on the availability of essential drugs. Hence, training and re-training of primary health care facility managers on essential drugs and its management by the Sokoto state government through the State Primary Health Care Development Agency (SPHCDA) and Pull system of drug supply should be encouraged as this will ensure adequate availability of essential drugs in the primary health care centres.

ACKNOWLEDGEMENT

The authors would like to thank the study participants for providing responses. We sincerely declare that there was no conflict of interest and receive no funding for this research.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. World Health Organization (WHO). Management of drugs at health centre level. In: Training Manual. World health organization regional office for Africa: Brazzaville; 2004.
2. Community-Based Health Planning and Services (CHPS), Community Health Officer Training Manual. Ministry of Health/Ghana Health Service National Health Learning Materials Centre. 2009;1.
3. Maiti R, Bhatia V, Padhy BM, et al. Essential medicines: An Indian perspective. Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine. 2105;40(4):223.
4. Cameron A, Ewen M, Ross-Degnan D, et al., Medicine prices, availability, and affordability in 36 developing and middle-income countries: A secondary analysis. The Lancet. 2009;373(9659):240-249.
5. WHO/HAI. Measuring Medicine Prices, Availability, Affordability and Price Components; 2008a. WHO/PSM/PAR/2008.3.
6. WHO. The world health report 2006 – Working together for health. Geneva, Switzerlan; 2006.
7. Bertollini R. Global health policy forum on access to medicines. World Health Organization; 2014.
8. Bansal D, Purohit VK. Accessibility and use of essential medicines in health care: Current progress and challenges in India. Journal of pharmacology & pharmacotherapeutics. 2013;4(1):13.
9. MSH/WHO. Managing drug supply: The selection, procurement, distribution and use of pharmaceuticals. second edition, revised and expanded edn. Kumarian Press: USA; 1997.
10. Laing R, Waning B, Gray A, et al. 25 years of the WHO essential medicines lists: progress and challenges. The Lancet. 2003;361(9370):1723-1729.
11. Kar SS, Pradhan HS, Mohanta GP. Concept of essential medicines and rational use in public health. Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine. 2010;35(1): 10.
12. Daniel WW, Cross CL. Biostatistics: A foundation for analysis in the health sciences; 1995.

13. Federal Ministry of Health (FMOH). Essential medicines list 5th revision. Abuja: Federal Ministry of Health, Abuja, Nigeria; 2010.
14. Gelders S, Ewen M, Noguchi N, et al. Price, availability and affordability: An International Comparison of Chronic Diseases Medicines; 2006.
15. Cameron A, Ewen M, Auton M, et al., Medicines prices, availability and affordability. The World Medicines Situation; 2011.
16. Magarinos-Torres R, Pepe V, Oliveira M, et al. Essential medicines and the selection process in management practices of pharmaceutical services in Brazilian states and municipalities. Cien Saude Colet. 2014;19(9):3859-3868.
17. Seoane-Vazquez, Rodriguez-Monguio R. Access to essential drugs in Guyana: A public health challenge. Int J Health Plann Manage. 2010;25(1):2-1.
18. Kotwani A. Where are we now: Assessing the price, availability and affordability of essential medicines in Delhi as India plans free medicine for all. BMC Health Serv Res. 2013;13:285.
19. Babar ZU, Ibrahim MI, Singh H, et al. Evaluating drug prices, availability, affordability, and price components: Implications for access to drugs in Malaysia. PLoS Med. 2007;27;4(3):e82.
20. Yang H, Dib H, Zhu M, et al. Prices, availability and affordability of essential medicines in rural areas of Hubei Province, China. Health Policy Plan. 2010;25(3): 219-229.
21. Carasso BS, Lagarde M, Tesfaye A, et al. Availability of essential medicines in Ethiopia: An efficiency-equity trade-off? Tropical Medicine and International Health. 2009b;14(11):1394–1400.
22. Elamin E, Ibrahim M, Yousif M. Availability of Essential Medicines in Sudan. Sudanese Journal of Public Health. 2010; 5(1).
23. Mhlanga B, Suleman F. Price, availability and affordability of medicines. Afr J Prm Health Care Fam Med. 2014;6(1).
24. Sambo M, Lewis I, Sabitu K. Essential drugs in primary health centres of north central Nigeria; where is Bamako initiative? Niger J Clin Pract. 2008;11(1):9-13.
25. Saouadogo H. Measuring availability, affordability and management of essential medicines in public hospitals of Burkina Faso. World Hosp Health Serv. 2011; 47(1):8-11.
26. Baumgarten I. Availability and management of Medicines and Medical supplies: Findings of an assessment of 87 Health facilities in four Regions in Tanzania. In: Tanzania German Programme to Support Health (TGPSH). Dar es Salaam, Tanzania; 2011.
27. Community health registration board of Nigeria. Curriculum for diploma in community health. CHRBN, Abuja; 2006.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history/24942