Sir,

Consumption of medicines has increased over the years due to an increase in the availability of treatment for most diseases and the growing public interest in health and health products. Medications in households lead to medication wastage which has an economic impact. Globally, unused medications cost billions of dollars. Some reasons identified as causes of unused medication are over prescribing, change in treatment plan, adverse drug event, medication reaching expiry dates, and non-adherence to therapy. In Nigeria, medicine financing is mainly out-of-pocket, with a few individuals benefiting from insurance coverage. This implies that most burdens of economic loss due to unused/expired medications lie on household members. Unused medication in households has not been studied in Nigeria. This research is aimed at determining the common classes of unused medications in households and medication disposal practices.

The study was conducted from November 2010 through February 2011 in Jos North Local Government area, Plateau state, Nigeria. Six hundred and fifty two households were recruited by stratifying the local government area into different political wards and household from each stratum were selected through a systematic, random sampling technique. Respondents from each household were interviewed using a pre-tested questionnaire which addresses the issues of demography, unused medicines in homes and medicine disposal practices. Informed consents were obtained from the participants before the interview. We considered left over medicines as unused medications in this study. Their names, strength, dosage form, expiry date, and quantity were recorded. Data obtained were entered into Statistical Package for Social Sciences (SPSS) to generate descriptive statistics which were represented in percentages. A total of 427 households participated in the study, which represents 65.5% of the recruited households. The mean family size and age (years) of interviewee were 5.8 and 36.4, respectively. About 58% of household heads had secondary education and only 3.5% of households had insurance coverage. The results showed that 94.1% of households had unused medicines. Two thousand nine hundred and four unused medicine items were found in households representing a mean of 6.8 items per household. A total of 41.7% and 58.3% of the unused medicines were obtained on prescription and self-medication, respectively. The community pharmacies (52.1%) and patent medicine vendors (33.3%) were the common sources of these medicines. About 0.7% of the medicines found in households were expired and 15.6% were unlabeled. The common types of medicines kept in households were analgesics (18.6%), antibiotics (16.8%), and nutrition/blood preparations (14.9%) [Table 1]. All respondents of households reported that they dispose their medicines in the dustbin/trash can.

The mean number of unused medications found in households is unsurprising because in Nigeria, self-medication is common. Most people keep unused medications at home either for re-
use or to give it to someone else who has similar problem
with them. Furthermore, these medications may be a result
of non-adherence to therapy. The most common classes of
medicines found in households were analgesics, antibiotics,
and nutrition/blood preparations. In Nigeria, analgesics are
the most commonly procured medicines and self-medication
with them is high. They are usually the first line of medicines
used by community members in an event of illness. This
is because most illnesses present with pain and fever, and
households keep analgesics for use in an event of illness.
The high amount of antibiotics found in households is an
indication of inappropriate use of antibiotics and can lead
to resistance which is a major challenge in the treatment of
infectious diseases in developing countries. Nutrition/blood
preparations are common in households because people take
them as supplements for promoting health, preventing illness,
boosting the immune system, prevention of stress, and to
supplement regular nutrition.[4] Hence, their use is usually
seen as part of a healthy lifestyle. In Nigeria, medicines are
commonly dispensed without appropriate labeling. Most
dispensing envelopes do not contain names and expiry dates
of dispensed medicine. Household members only identify
these medicines with certain symptoms and diseases. This can
lead to the administration of wrong medicines for a disease
condition. This calls for appropriate labeling of medicines
during dispensing.

Basic education on appropriate disposal of medicines is lacking in Nigeria. Unused/expired medications are
not returned to pharmacies for appropriate disposal as
obtainable in developed countries. The accumulations of
pharmaceuticals in the soil, ground water, and drinking
water have been reported.[5] However, no such studies have
been done in Nigeria, but it is likely that these compounds
are accumulating in the environment, since they are mostly
disposed in refuse dump. Hence, there is a need for public
education on appropriate disposal of medicines. In addition,
government should encourage reverse distribution network
in which community members are encouraged to return
unwanted medications to pharmacies which then arrange for
approved agents/bodies to collect and destroy them.

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| Class                  | Percentage (%) |
|------------------------|----------------|
| Antihistamines         | 5.9            |
| Analgesics             | 18.6           |
| Nutrition and blood preparations | 14.9   |
| Antacids               | 2.2            |
| Antidiarrheals         | 0.6            |
| Antihypertensives      | 5.6            |
| Antipsychotics         | 3.4            |
| Antibiotics            | 16.8           |
| Antidiabetics          | 1.6            |
| Antimalarias           | 7.5            |
| Antispasmodics         | 1.2            |
| Contraceptives         | 0.9            |
| Eye preparations       | 1.5            |
| Others                 | 19.3           |