

Use of Aerosol Insecticides For Mosquito Control: Adoption of the Recommended Safety Regulations by the Household Users

Augustine J. Udoh¹ and Vincent U. Essien²

1. Professor, Department of Agricultural Economics and Extension, University of Uyo, Uyo, Akwa Ibom State, Nigeria, 2. College of Arts and Science, Nung Ukim, Ikono, Akwa Ibom State

Corresponding author e-mail: *augtine@yahoo.com*

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ABSTRACT

Malaria has been established and is noted as a major threat to the health of thousands of millions of inhabitants in the tropical and sub-tropical nations and causes more than two million deaths in a year with the majority being children and pregnant women. Both rural and urban households use several aerosol insecticides to fight mosquitoes indoors which feed on human blood to provide food for their eggs and in the process transmit malaria. A study was undertaken in Akwa Ibom State of Nigeria to investigate if the household users of aerosol insecticides are adopting the recommended safety regulations on the labels of the insecticides. Sixty rural and 60 urban household users of aerosol insecticides were randomly selected from 6 blocks in the study area. Four out of nine aerosol insecticides found in the study area and mostly used by the households were used for the assessment. The findings of the study show that over 98% of both rural and urban household users of the aerosol insecticides use a minimum of 20-30 seconds to spray the insecticides at the required areas. Over 50% of the users of the aerosols did not take pains to read the instructions on the labels because the products are easy to use. However, the users admit the satisfaction with the instant action-performance of the aerosols. The urban households used 50% more aerosols than their rural counterparts within the 12 months of the year. It is recommended that manufacturers of aerosol insecticides should develop the insecticides handy for outdoors, where mosquitoes breed and move into houses. Awareness campaigns and use of the insecticides should be intensified.

Keywords: *Aerosol; Insecticides; Malaria; Control measures; Household users;*

Malaria has been established and is noted for causing a lot of havoc discourses in the lives of numerous families. According to *Marsh (2000)*, malaria is a major threat to the health of thousands of millions of inhabitants in the tropical and sub-tropical nations and causes more than two million deaths a year with the majority being children and in the sub-Sahara Africa. Equally, one of the high-risk groups to malaria attack is pregnant women.

No malaria vaccines are yet available although *SPORE (August, 2002)* reports that the National Institute of Allergy and Infectious Diseases (NIAD) would soon start a clinical test of malaria vaccines derived from goat milk. But at the moment, other control strategies include: use of insecticides to kill the mosquitoes and bed nets to prevent mosquito bites. The World Health Organisation

(WHO) in *SPORE (February, 2002)* indicates that the single disease of malaria reduces the Gross National Product (GNP) of countries in sub-Saharan Africa by more than 1 per cent and rising to as much as 1-5 per cent in Nigeria and 2-6 per cent in Kenya respectively. This then indicates the extent of prevalence and intensity of malaria in these countries in particular and in the continent in general. This study therefore investigates the orientation and information label of products on aerosols cans and the consumption of the aerosol insecticides with safety regulations by the households.

METHODOLOGY

A survey of the supermarkets, convenient shops and small traders on household consumable products

was undertaken in Uyo Urban and its rural outskirts of Akwa Ibom State to establish the sources where consumers obtain their aerosol insecticides to fight mosquitoes. Uyo, the capital of Akwa Ibom State was divided into six blocks and the rural outskirts of the six blocks were adopted to take part in the study. The study adopted three stages: viz. Survey of 18 supermarkets and 22 small stores in the area to identify the aerosol insecticides sold; an evaluation of the label descriptions of the respective insecticides found in the market and used by the households; and administration of questionnaire to 60 rural households and 60 urban households randomly selected from the six blocks. The data were collected with the help of interview method and processed into the statistical analyses like frequency and percentage.

RESULTS AND DISCUSSION

Instruction on labels for use of household aerosol insecticides: Nine different brands of insecticides were found in 100 per cent of the 18 supermarkets and in 86 per cent of the 22 small stores with household consumable products ranging from sugar, butter, biscuit, soft drinks, toiletries, stationeries and frozen products such as ice cream, meat and fish, yogurt, to children's toys. There was a good spread of the aerosol insecticides. Instructions on the label of the aerosol insecticides also ranged from direction of sprays, target of sprays and precaution with regards to maximum time to stay off the room or area sprayed, and ventilation to re-entry of the area after spraying.

The findings from the study show that over 98 per cent of both rural and urban household consumers of the aerosol insecticides use a minimum of 15-20 seconds to spray the insecticides at the required areas; 15 - 20 seconds means increased use time (3-5 times) compared to recommended spray time of 4-6 seconds, i.e. minimum of 4 and maximum of 6 seconds. Though Raid states a long term effect of spray for up to four weeks, consumers of the product according to our findings spray the product whenever mosquito attacks! This indicates that the product may have been over used and above the recommended time. This could be injurious to children's health especially who sleep for longer hours after the rooms had been sprayed. This study reveals that rural and urban households had between 8-13 residents per household and most of them children.

Exposure of children to farm chemicals had been established by *Udoh (1998)* and *Simcox and Feaske (1995)* and therefore in rural households, it means the chances of children being exposed to the household insecticides due to mosquitoes are high. The consumers of aerosol insecticides spraying the products whenever mosquito attack and spraying for a minimum of 15-20 seconds instead of 4-6 seconds indicates the extent of mosquito attacks and also shows that spraying the insecticides only inside the rooms does not solve the problem of mosquito attacks.

Precautions : The manufacturers' emphasis to keep the products out of reach of children is very pronounced on the labels. However, a majority of the 2 million deaths from malaria annually is said to be children (*Marsh, 2000*). A precaution that was generally ignored by users of aerosol insecticides is washing of hands after the use of the products. The findings reveal that the main reason for not adhering to the precaution is that the products do not spill on hands during use. Similarly, opening of doors and windows to ventilate the rooms, on re-entry was also overwhelmingly ignored by consumers of aerosols insecticides. Their reason for the behaviour was also overwhelming. The respondent-consumers expressed that opening doors and windows with no mosquito nets after spraying means inviting a new team of the insect-mosquitoes into the rooms. The issue of members of households not leaving the rooms for prescribed time means the fight against mosquitoes must be extended to the surroundings of the living quarters and beyond.

Frequency in use of products: : The consumption pattern of aerosol insecticide round the year by both rural and urban households is shown in Fig. 1. There was no significant difference between the rural and urban households on the use of a particular aerosol insecticide in the study period. The reason is because the consumers do not have a choice as all the aerosol insecticides do the same job i.e. kill mosquitoes. However, consumers give the manufacturers of aerosol insecticides a plus in that the main purpose of their buying the products is to fight mosquitoes but the products also kill cockroaches, flies and other household insects. But there is a significant difference between the rural and urban households in the consumption level of the products during the period of study. The urban households consumed about 50 per cent more aerosol insecticides than their rural counterparts. This goes to explain the intensity of mosquito attack around

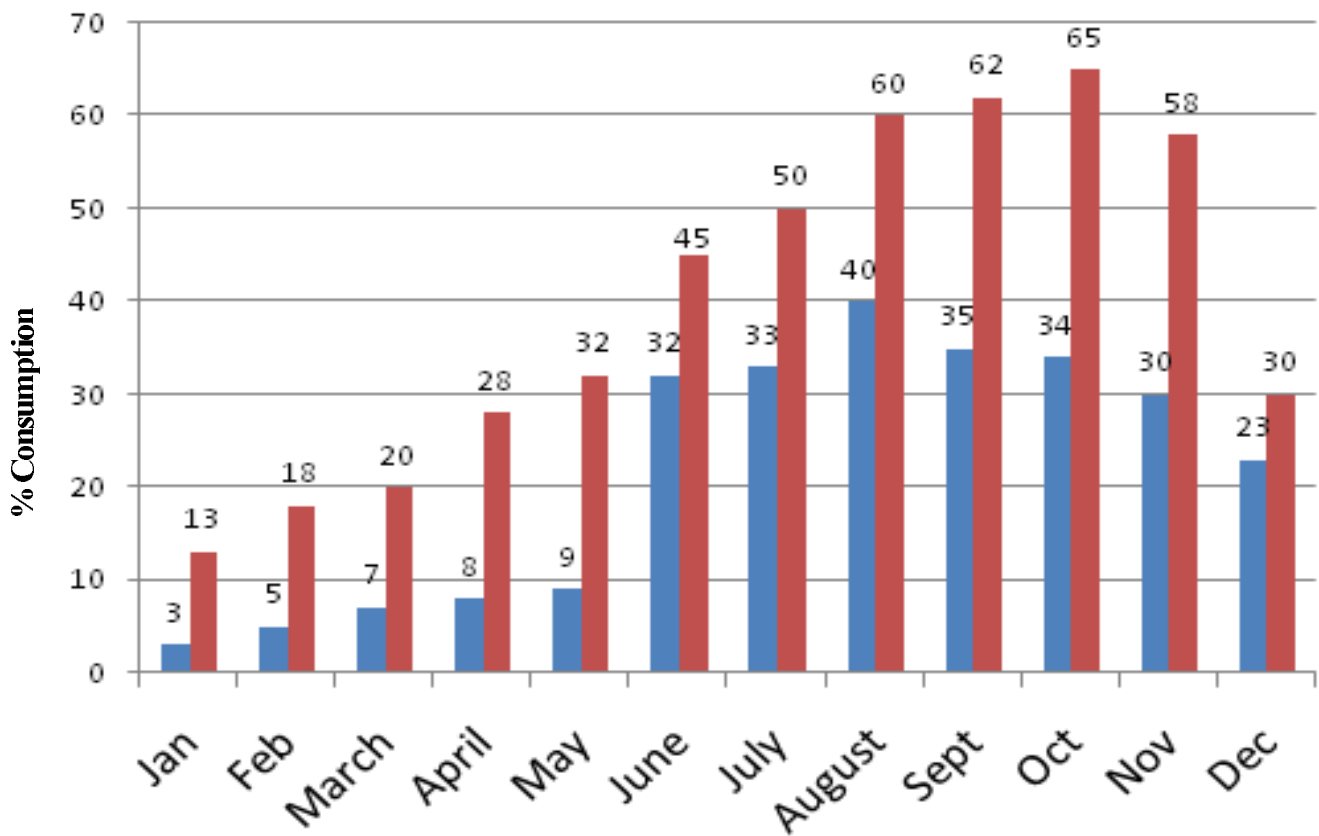


Fig. 1. Consumption levels of aerosol insecticides by rural and urban households

the year because of available water for breeding in blocked culverts and in untreated sewage tanks. According to *Appropriate Tech (2002)*, malaria and other mosquito-borne diseases increase in areas around dams, quarries and irrigation schemes which provide water required for mosquito development from egg-laying to larva.

Beside information on frequency of use of products, Mobil Insecticide shows on the label that its product contains no chlorofluorocarbon (CFC). While Mortein Instant Power indicates on its label that the product is not injurious under normal use. The Raid Insect Killer states precisely that its product contains no CFC alleged to damage ozone. However, for Rambo, its aerosol products had no information on environmental effect. An insignificant proportion of the urban households (2%) were conscious of the labels on aerosol cans about environmental effect and the ozone layer in particular. Information on environmental effect is essential and is mandatory for most products in recent times. Therefore, it is quite useful to make such available to the consumers.

This study uses an Ordinary Least Square (OLS) regression to identify factors affecting an individual's maximum willingness to abide by the safety regulations.

The dependent variable here is the highest amount an individual can pay for the aerosol insecticide. The explanatory variables were the same as for Probit regression. It is observed that men in the African society have control over resources and also acquire more income than their women counterparts. Besides, the men folk may have a better knowledge in the alternatives of aerosol insecticides because of a greater freedom in mobility than the women folk in the society. Therefore, it was assumed that the males would show greater preference for using aerosol insecticides and by even paying a little extra for the products. The older respondents were expected to pay less for the aerosol products because for those who may have retired in civil service in the urban, their income must be spent particularly on items that are necessary and demanding and not on aerosol products, which they may have an alternative. Furthermore, formal education was assumed to be positive because educated people were likely to have a better knowledge on the effects of the aerosol insecticides and therefore, the value of safety regulations. *Adhikari et. al. (2004)* observed a similar situation on pesticide use.

An individual's knowledge on the negative consequences of aerosol insecticides use, especially the effect on the environment and human health for misuse of the product may accept the safety measures. It was therefore, hypothesized that whether or not an individual knew the side-effects of the aerosols on environment and human health positively determined the respondent's probability of accepting the safety measures.

Aerosols are insecticides, reading the insecticides labels prior to spraying or application helps to develop awareness on the aerosol insecticide's hazards. For an individual, who is knowledgeable about insecticide labels can classify insecticides according to their hazards to human health. Consequently, such an individual may be more attentive to the effects of insecticides such as aerosols on health. Therefore, it was assumed that an individual who is aware of and can understand the label on the insecticide container will be willing to adopt the safety measures.

CONCLUSION

Malaria is widespread in the sub-Saharan Africa and is responsible for 2 million deaths annually. Besides, malaria has a disastrous effect on the work force which results in loss of output and income. Most victims of malaria are children and pregnant women. There is a rampant use of aerosol insecticides by rural and urban households in Nigeria to control mosquito, a vector to

malaria parasite. The attention to control malaria has been so much on the use of aerosol insecticides by both the rural and urban households within indoors.

Therefore, manufacturers of aerosol insecticides should now develop insecticides handy for outdoors, where mosquitoes breed and move into houses. The governments at national, state and local levels have strong roles to play by providing an effective and efficient drainage system especially in the urban centres to remove standing water from and around residential, office and market areas. Manufacturers of aerosol insecticides should increase the rate of advertising of their products on radio and television and with emphasis not only on the effect of their products on mosquitoes and other pests but also on the effective and safe use of their products by the consumers. Though the advertisements may increase the sales for manufacturers, this will be with a greater added value to human lives and environment. Government should support campaigns on the use of new programmes and mobilization of residents of both rural and urban communities to take part in vector and malaria control. Environmental management of mosquito breeding sites to prevent outbreaks should be mandatory. The vectors must be controlled at all stages from eggs to larvae, pupae and to full grown mosquito. It will be feasible also for producers of insecticides and extension agencies to include the use of insecticides in their extension teaching methods.

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