

## Research Article

# Determinants of Intermittent Presumptive Treatment Uptake in the Prevention of Placenta Malaria among Women in Fishing Communities in Entebbe, Uganda

Geoffrey Kirabira, Ivan Mugisha Taremwa\*, and Christine Atuhairwe

Department of Medical Laboratory Sciences, Clarke International University, Uganda

**\*Corresponding author**

Ivan Mugisha Taremwa, Department of Medical Laboratory Sciences, Clarke International University, Uganda, Tel: 2567-7434-6368; Email: imugisha@gmail.com

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**Abstract**

**Background:** The burden and effects of malaria during pregnancy remains high in Uganda. To mitigate its effect, apt and effective use of Intermittent Presumptive Treatment (IPTp) has been widely recognized. Although with proven impact, access and use of IPTp remains at stake due to a number of factors. We explored the determinants of IPTp uptake among women living in Nakiwogo and Kigungu fishing sites in Entebbe District.

**Methods:** A cross sectional study among fishing communities was done. We enrolled households with pregnant women, and/or children aged 4/6 months using Simple random sampling. Data was collected using a structured questionnaire, focus group discussion and key informant interviews among the Municipal Health Officer and Health Inspectors on the use of IPT for the prevention of malaria in pregnancy. The key informants were selected using purposive sampling method. Pearson Correlations Coefficient and Adjusted Odds Ratio were used to ascertain factors that influenced IPT-2 uptake.

**Results:** The study enrolled 125 women. Of these, 51 (40.8%) were aged between 18 to 25 years, 91 (72.8%) reported having utilized IPTp and only 59 (47.2%) had not experienced malaria. Pregnant women and women with babies less than 4/6 months were 78 (62.4%) and 47 (37.6%) in number respectively. The factors and their adjusted odds ratio (AOR) that were significantly associated with IPTp uptake are: age [AOR, 2.80, p-value, 0.008, CI, 2.74-3.00], Attendance to ANC services [AOR, 1.18, p-value 0.001, CI, 1.61-1.91], Knowledge about IPT [AOR, 3.86, p-value 0.005, CI, 2.87-3.96], Adherence to ANC services [AOR, 2.95, p-value, 0.001, CI, 1.54-2.98]. Income, [AOR, 1.66, p-value, 0.003, CI, 1.18-2.77], marital status, [AOR, 2.86, p-value, 0.007, CI, 2.11-3.76] and spousal support [AOR, 1.55, p-value 0.012, CI, 1.00-2.22], availability of IPT drugs [AOR, 1.16, p-value, 0.009, CI 1.05-2.01], availability of skilled staff [AOR, 3.87, p-value, 0.011, CI, 2.21-3.91] and community sensitization [AOR, 2.19, p-value, 0.010, CI, 1.88-2.29].

**Conclusions and recommendation:** The level of IPT uptake among women was high at 91 (72.8%). The determinants of IPT-2 were age, ANC attendance and adherence, knowledge about IPT, higher income, being married and with spousal support, availability of IPT drugs, skilled staff and community sensitization. To this, it's critical that the Ministry of Health ought to strategize for malaria prevention through free IPTp drug in a highly malaria endemic set up.

**ABBREVIATIONS**

ANC: Antenatal Care; IPTp: Intermittent Presumptive Treatment; WHO: World Health Organization

**INTRODUCTION**

Malaria in pregnancy is a major cause of high maternal and fetal mortality rates; accounting for 436 per 100,000 live births prenatal mortality [1]. According to the Ministry of Health, Uganda (2016), there were 45% of women receiving two or more doses of IPTp, the same proportion that was reported in 2014. This has obliged an increase in IPTp uptake as a key focus of malaria prevention in pregnancy [1]. The support has been provided through provision of insecticide treated bed nets, IPTp, and

early diagnosis and prompt treatment of malaria in pregnancy [1]. Malaria is associated with such complications like maternal anaemia, abortion, intrauterine fetal growth retardation, premature delivery, low birth weights and stillbirth [2]. Due to life-threatening effects of malaria, its prevention is key among pregnant women [3]. One strategy that has been undertaken is the use of Intermittent Presumptive Treatment (IPTp) which is used to clear the non-clinical parasitemia and eliminate the adverse effects of malaria [4,5]. Individuals including women residing around the fishing sites carry a greater risk of acquiring malaria with likely fatal outcome. In Uganda, Ministry of Health report [6] indicated that a half of the 80.0 percent target of pregnant women can access and utilize the required two doses of IPTp from all health facilities. The barriers to IPTp access are setbacks

to fetal-maternal wellbeing, and may portend global efforts to attain Sustainable Development Goals especially goal 3. Although its magnitude is wide, the attributable factor to this phenomenon includes: inadequate awareness, distant health facilities, limited spousal support and inadequate drugs/medicines among these health facilities [6].

The burden of malaria remains high at fishing sites despite government's effort to reduce the burden through mosquito nets and IPTp [7]. The ever increasing burden of malaria and gaps in its prevention prompted an exploration into the determinants of IPTp uptake at Nakiwogo and Kigungu fishing sites.

## MATERIALS AND METHODS

### Study site

We conducted the study in Wakiso District, located in Uganda's central region and the second most populated, with a population of 2,007,700 as per the 2014 census and covers a total area of 2,807.75 square kilometers. In Entebbe town, Nakiwogo and Kigungu fishing sites were purposively selected. Kigungu fishing site has a population of 29,282 people, of which 14,813 are females. Nakiwogo has a population of 8,573 people, of which 3,894 are females [8]. Entebbe is a town located in Wakiso District, approximately 37 kilometres (23 mi) southwest of Kampala, Uganda's capital. The municipality is located on a peninsula into Lake Victoria, covering a total area of 56.2 square kilometers (21.7 sq mi), out of which 20 km<sup>2</sup> (7.7 sq mi) is water. Entebbe was purposively selected because of its location on the shores of Lake Victoria.

### Study design

A cross sectional study was carried out in Nakiwogo and Kigungu fishing sites from May to October, 2017 in Entebbe Municipality.

### Study respondents, sample size estimation and recruitment

The respondents enrolled in the study were women who had children that were one year or less in age at the time of the study. Assuming a 95% confidence interval, proportion of fishing community members that had received government long lasting insecticide treated nets (LLN) estimated to be 84.9%, [7] and the maximum allowable error at 5%; 197 women were estimated. The units of study were Nakiwogo and Kigungu fishing communities. A list of names for the fishing community members who received Government long lasting insecticide-treated nets (LLN) was obtained and every third respondent was selected using stratified sampling. The study included women with babies less than 4/6 months and or pregnant women more than 7 months. Only women (18-49 years) in these categories who had received IPT; that had consented to the study were interviewed at their homes.

### Data collection and management

The data was captured using questionnaires developed from existing literature on the study area. The tools used to collect data were questionnaire, interview-guide and focus group discussion (FGD) guide. After formulating the questionnaires, they were pre-tested by the research assistants to ensure clarity and consistencies. A structured questionnaire was designed for

mothers in fishing community as supposed to uptake intermittent presumptive treatment (IPT-2) based on sections and subsections covering the study objectives and other variables. Two FGDs were conducted each containing 8-10 participants, one for mothers with babies and another with pregnant women. Questions asked in the FGDs were about utilization, maternal, socio-economic and health care factors influencing uptake of IPT-2 for the prevention of malaria in pregnancy. Quantitative data was elicited from a total of 125 households with pregnant and mother with babies less than 4/6 months obtained from Nakiwogo and Kigungu fishing sites. Only completed questionnaires were adopted in order to ensure internal validity. The interview-guide was used to elicit qualitative information from the malaria focal person. We considered IPT uptake (took at least 2 doses versus none) as the dependent variable and the independent variables were maternal factors, socio-economic factors and health care factors. The study variables were: Dependent variable was uptake of IPTp and the independent variables were: Maternal Factors (Age, education, parity, place of delivery, antenatal care attendance, knowledge about IPT, malaria fever experience, adherence to ANC services); Socio-Economic Factors (Income, religion, occupation, marital status and nature of housing facility); Health Care Factors were (Availability of antenatal care facilities, availability of skilled staff, waiting time at the facility, distance to the health care facility, availability drugs and equipment, community mobilization, community sensitization and area of coverage). The intervening variables were IPTp funding and Health staff motivation. Questions on staff training, availability of skilled staff among others were answered by 125 respondents (mothers with babies and pregnant women) in addition the 2 key informants also answered questions related to these factors in the interview-guide.

### Data management and analysis

This was done using SPSS version 20.0. Data was analyzed using logistic regression for the study variables of community mobilization, availability of staff and availability of skilled labor among others. At univariate analysis, variables that were found to be significant at bivariate with a p value of less than 0.05 were considered further for bivariate analyses, and at this level, such variables with a p-value less than 0.05 were considered to be significantly associated with IPTp uptake. The qualitative data was analysed using content analyses of the views and opinions of both women and care givers (Health workers).

### Ethical considerations

Ethical approval was obtained from research and ethics committee of Clarke International University (formerly, International Health Sciences University). Authorization letter was obtained from relevant local council authorities of Entebbe Municipality, and informed consent was sought from study participants. Only the participants that consented were recruited in the study.

## RESULTS AND DISCUSSION

### Socio-demographic characteristic of the participants

One hundred and twenty five women were interviewed; of these, 25 were pregnant while 100 were mothers with babies less than 4/6 months. Only 91(72.8%) reported having utilized

IPTp in the second and third trimester (N=77, 84.6% and N=14, 15.4%) respectively. Sixty-four participants (70.3%) had at least two IPTp doses, and 73(80.2%) had adhered. The odds of women aged 25 years and above using IPT were over two-folds than those between 18-25 years, multiparous women were 1.74-folds greater odds to use IPTp, a woman who delivered in a private health facility was 2.90-folds greater odds to use IPTp as compared to those who delivered in a public health facility, pregnant women who attended antenatal care were three-folds greater odds to uptake IPTp than those who missed ANC visits, awareness of IPTp increased its uptake by more than two and half folds compared to women who were not aware, finally, malaria experience almost doubled odds of IPTp uptake compared to women who have never experienced malaria. The variables age, place of delivery, ANC attendance, IPTp awareness, malaria experience and adherence to ANC services were the determinants of IPTp uptake, as given in Table 1.

In the FGD with women from Kigungu fishing site, a participant noted that infection with malaria is common when she gets pregnant; she ensures that she visits the health facility and delivers from there to avoid any complications at the time of delivery. This was considered a critical to malaria awareness, and prevention strategy as given in the verbatim; 'we live here and this place acts as a source of mosquitoes, so we as expectant

mothers, we are likely to get and experience malaria so uptake of IPT-2 is one of the solutions' (Participant,-Kigungu).

A key informant pointed out that some women go to health facilities when they are infected with human immune deficiency (HIV) and sexually transmitted diseases (STDs). These infections affect how IPTp is utilized. She noted that such women would consider treating other infections first. In addition, it was also revealed that knowledge about malaria and its dangers to their pregnancy enhanced utilization of IPTp. Another key informant noted that participants had passable knowledge about IPTp and this hastened its uptake. Further, misconceptions about malaria had been demystified by the increased community sensitization during ANC and the village health teams (VHTs) who make home visits.

### Socio-economic determinants of IPTp uptake

The variables of employment, occupation and salary above 250,000 Uganda Shilling, being married and spousal support were determinants of IPTp uptake, as shown in Table 2. Accordingly, a higher income greater than 250,000 Ugandan Shillings almost doubled the odds of IPTp uptake compared to women who lived in households that earned less than 250,000 Ugandan Shillings. Also, women who were employed were two-fold greater odds to use IPTp than those unemployed. Finally, women who were

**Table 1:** Socio-demographic determinants of IPTp uptake among women in Entebbe, Uganda.

Variables	Variable Category	Utilized IPT	Did not Utilize IPT	Odds Ratio	P-Value	95% C.I	
						Lower	Upper
Age	<25 years	27(29.7)	24(70.6)	2.18	0.001*	1.94	3.01
	>25 years	64(70.3)	10(29.4)				
	Total (%)	91(72.8)	34(27.2)				
Education	Never went to school	4(4.4)	1(2.9)	1.09	0.738	0.53	1.79
	Primary	37(40.8)	15(44.1)				
	Secondary	40(43.9)	14(41.2)				
	Tertiary	10(10.9)	4(11.8)				
Parity	1-2 Birth	51(56)	29(85.3)	1.74	0.214	1.26	2.07
	>3 Birth	40(44)	14(41.2)				
Place of Delivery	Health Facility-Public	38(41.8)	2(5.9)	2.90	0.009*	2.07	3.91
	Health Facility-Private	51(56.0)	24(70.6)				
	Home	2(2.2)	5(14.7)				
	Traditional Birth Attendant	0(0.0)	3(8.8)				
Antenatal Care Attendance	Yes	90(98.9)	30(88.2)	3.01	0.004*	3.00	3.82
	No	1(1.1)	4(11.8)				
IPT awareness	Yes	85(93.4)	29(85.4)	2.67	0.005*	1.04	2.79
	No	6 (6.6)	5(14.7)				
Malaria Experience	Yes	54(59.3)	5(14.7)	1.91	0.007*	1.99	2.04
	No	37(40.7)	29(85.4)				
Adherence to ANC Services	Yes	73(80.2)	0(0.0)	1.55	0.002*	1.17	2.93
	No	18(19.8)	0(0.0)				
Pre-pregnancy Immunity	Yes	54(59.3)	5(14.7)	0.89	0.812	0.93	1.07
	No	37(40.7)	29(85.4)				

\* Statistical significant at 0.05 Level of Significance

supported by their husbands were almost thrice greater odds to uptake IPTp compared to those who lacked spousal support. To explore the spousal support, an FGD respondent said that: "To me I thank my husband who has been there for me in terms of giving transport to go to the health facility and at times we go together if he is not too busy with work..." (FGD-Participant).

### Health care determinants of IPTp uptake

Health care factors indicated that 97(77.6%) of the respondents paid for IPTp drugs. IPTp training covered 89 (71.2%) of the participants. Skilled staff at the facilities were available as reported by 112 (89.6%) of the participants, and 91(72.8%) of the participants covered 2-5km distance to access IPTp, as given in Table 3. From this table, women who knew the cost of IPTp were more than a half greater to uptake IPTp than those who did not know the cost. Relatedly, community mobilization increased IPTp uptake by 1.9 folds greater than those who were not mobilized, while women who were community sensitized were 2.11 folds greater to uptake IPTp than those who were not sensitized. Availability of skilled staff at the health facility was more than three-times greater to affect IPTp uptake than those facilities that did not have skilled staffs. The qualitative data revealed that more women still delivered from clinics as given in the narrative: For me I normally give birth from the clinic due to the high costs for hospitals and therefore, my ANC attendance at times does not occur so there is no way I can be given IPT-2 to prevent me from malaria despite sensitization at the community level (FDG Participant- Nakiwogo). Qualitative results indicated

that participants paid for the IPT-2 services and most considered the cost unfair. In this verbatim, a participant indicated that the cost of the IPTp was a hindrance; "The cost of the service is too high given the fact that our income is small so this affects us in terms of IPT utilization here at Nakiwogo (FGD participant). Logistic regression analyses revealed age, marital status, spousal support, IPT awareness, ANC attendance and adherence, income, availability of IPT drugs and skilled staff, community mobilization and sensitization as determinants of IPTp uptake.

Based on this study, we found a high utilization of IPTp among women of Nakiwogo and Kigungu fishing sites. This may be attributed to the awareness about IPT due to their vulnerability and high risk for acquiring malaria as they live near water sources. This is in agreement with what was reported in Ghana [10] and Nigeria [11]. Majority of the participants had taken IPTp dosage in their second and third trimesters a feature that may be ascribed to differences in time periods to start ANC visits, similar to what was reported in Kenya [12].

Exploration of determinants of IPTp uptake indicated varied factors. Maternal age of above 25 years was 3.60 times more associated with IPTp uptake. Although composite, this may be ascribed to the fact that they could have a higher parity and more skilled with pregnancy complications due to malaria. This was supported by the qualitative data by both FGD and key informants. The results are in tandem with what was observed in Kenya [13]. Also, ANC attendance influenced IPTp uptake as women who had adhered to ANC were 1.18 folds greater to uptake IPTp. This is

**Table 2:** Socio-economic determinants of IPTp uptake among women in Entebbe, Uganda.

Variables	Variable Category	Utilized IPT	Did not Utilize IPT	Odds Ratio	P-Value	95% C.I	
						Lower	Upper
Income	<100,000	20(21.9)	15(44.1)				
	100,001-250,000	19(20.9)	11(32.4)				
	>250,001	39(42.9)	6(17.7)	1.97	0.007*	1.00	2.08
Religion	Roman Catholic	10(10.9)	3(8.8)				
	Anglican	6(6.6)	10(29.4)				
	Muslim	70(76.9)	19(55.9)	0.09	0.931	0.01	1.09
	Pentecostal	5(5.5)	2(5.9)				
Employment Status	Employed	60(65.9)	17(50.0)	2.21	0.009*	2.00	2.98
	Unemployed	13(14.3)	2(5.9)				
	Self Employed	18(19.8)	15(44.1)				
Occupation	Business	14(15.4)	3(8.8)				
	Fish Monger/Seller	2(2.2)	3(8.8)				
	Fish Smoker	55(60.4)	25(73.5)	1.90	0.004*	1.11	2.01
	Food Vendor	5(5.5)	1(2.9)				
	Farmer	2(2.2)	0(0.0)				
	Housewife	13(14.3)	2(5.9)				
Marital Status	Divorced/Separated	19(20.9)	3(8.8)				
	Married/Cohabiting	72(79.1)	31(91.2)	1.33	0.003*	1.01	1.99
Spousal Support	Had Spousal Support	75(82.4)	24(70.6)	2.97	0.001*	2.95	3.04
	No Spousal Support	16(17.6)	10(29.4)				

\* Statistical significant at 0.05 Level of Significance

**Table 3:** Health care determinants of IPTp uptake among women in Entebbe, Uganda.

Variables	Variable Category	Utilized IPT	Did not Utilize IPT	Odds Ratio	P-Value	95% C.I	
						Lower	Upper
Cost of IPT Service	Yes	66(72.5)	26(76.5)	2.14	0.612	2.00	2.71
	No	25(27.5)	8(23.5)				
Community Mobilization	Yes	59(64.8)	25(73.5)	1.90	0.002*	1.19	2.98
	No	32(35.2)	9(26.5)				
Community Sensitization	Yes	73(80.2)	28(82.3)	2.11	0.006*	2.08	3.01
	No	18(19.8)	6(17.7)				
IPT Training Coverage	High	61(67.0)	28(82.3)	0.87	0.931	0.88	1.90
	Low	30(32.9)	6(17.7)				
Availability of ANC Facilities	Yes	79(86.8)	28(82.3)	1.03	0.009*	1.02	1.79
	No	12(13.2)	6(17.7)				
Availability of Skilled Staff	Yes	82(90.1)	30(88.2)	3.17	0.008*	1.97	3.90
	No	9(9.9)	4(11.8)				
Waiting Time at the Facility	Yes	60(65.9)	27(79.4)	0.91	0.946	0.89	0.99
	No	31(34.1)	7(20.6)				
Availability of IPT Drug	Yes	87(95.6)	28(82.3)	1.13	0.005*	0.11	1.17
	No	4(4.4)	6(17.7)				
Distance to the Health Facility	<0.5km	4(4.4)	4(11.8)				
	0.5-1 km	8(8.8)	16(47.1)				
	2-5km	77(84.6)	14(41.1)	0.76	0.764	0.34	1.90
	>5 km	2(2.2)	0(0.0)				
IPT Information Adequacy	Yes	84(92.3)	29(85.3)	1.54	0.004*	1.98	2.97
	No	7(7.7)	5(14.7)				

\* Statistical significant at 0.05 Level of Significance

attributed to the increased awareness by nurses and midwives. The results are further supported by the qualitative finding. This is similar to what was reported in Tanzania [14]. IPT awareness was also found a key determinant as women who had knowledge about IPT were 3.8 folds greater to utilize IPTp. This is explained by the fact that IPTp awareness increased the chances of malaria prevention, similar to what was reported in Tanzania [15], Nigeria [11] and as advanced by World Health Organization [16]. Household income influenced IPTp uptake as households which earned above 250,000 Uganda shillings were 1.6 folds greater to uptake IPTp. This is attributed to the purchasing power that goes with possession of money; therefore, one would regard such a category as being able to pay for IPTp services, transport and other health bills. A similar sentiment was indicated in Ghana [17]. This is true because low household income would not cover for transport costs and payments for the medical bills leading to poor utilization of health services, including IPTp. Marital status influenced uptake of IPTp as women who were married were 2.8 folds greater to uptake IPTp. This is attributed to the spouses' psychosocial and financial support. This is in agreement to findings from Nigeria [18]. Spousal support influenced uptake of IPTp due to care and financial help that such women attain from spouses. This is in agreement with previous findings [19], in which it was indicated that women whose husbands never supported them to utilize IPT were less likely to uptake IPTp. The

husband can remind them of when to take the drugs, encourage them to eat well as well as observing the ANC visitation days. Availability of IPT stocks was 1.16 times more likely to enhance IPTp uptake. In this study, 75 (60.0%) of women had delivered from private health facilities where the availability of IPTp tend to be higher compared to Government/Public health facilities. This is supported by WHO observation [16]. Skilled staff influenced uptake of IPTp. The results are in agreement with findings from Nigeria [20] and WHO [16]. In all, it was noted that skills by health workers regarding IPTp influenced the practice of IPTp among women in a manner that more women are compelled to uptake the service. Also, skilled health workers enable design of the training manuals for community sensitization and mobilization to uptake IPTp. Lastly, community sensitization increased IPTp uptake by 2.1 times more IPTp. This was too supported by the qualitative results. This may be attributed to increased awareness; making the entire community including husband to be vigilant towards the health of the pregnant woman and prevention against malaria. The results are in agreement with that reported in Kenya [13].

## CONCLUSION

The level of IPTp uptake among women was high at 91(72.8%). Age, attendance to ANC services, IPT awareness and adherence to ANC services influenced IPTp uptake among women. Further,

women with higher income, married with spousal support were more likely to uptake IPTp. Availability of IPTp stocks, skilled staff and community sensitization influenced IPTp uptake.

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