Maintaining universal coverage of long lasting insecticidal nets through distribution in schools in Uganda

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Poster number: 1688

KEY MESSAGES

- Distribution of long lasting insecticidal nets (LLINs) through schools can help maintain high household coverage.
- Households headed by females, those in the highest wealth quintile and those whose heads obtained tertiary or university education demonstrate higher LLIN coverage.

Introduction

As regular use of an LLIN substantially lowers one's risk of contracting malaria,[1] mass net distribution campaigns seek to achieve universal coverage (one net per two individuals). Distributing LLINs in schools and antenatal care (ANC) facilities to replace worn or lost nets could contribute to maintaining this goal. However, more evidence is needed to confirm this observation.

Therefore, we piloted a school LLIN distribution programme in June 2018 in 26 Ugandan districts with an LLIN coverage of less than 70% and measured the effects.

Methods

- Longitudinal data were collated — before distribution and six months after — from two representative population samples: 2,420 households in the intervention arm and 550 households in the control arm.
- To control for possible confounding, we ascertained that the proportion of pregnant women receiving LLINs during ANC visits was not significantly different in the intervention and control arms, at 63.4% (95% CI: 62.2–65.6%) and 63.1% (95% CI: 60.7–65.5%) respectively.
- We examined associations between universal LLIN coverage and a household's wealth, rural/urban location, geographical region, and the head of household's age, sex and education level. This was done through multivariate logistic regression to provide a difference in difference (DID) estimator — the difference in average outcome in the intervention arm minus the difference in average outcome in the control arm.

Results

- Households that received LLINs through school distributions were 80% more likely to sustain adequate levels of coverage.
- While the proportion of households with sufficient nets grew non-significantly from 68.5 to 70.7% in the intervention arm, it fell significantly in the control arm from 78.2 to 69.6%.
- Female headed households were 70% more likely to have sufficient nets than those with male heads.
- Households from the highest wealth quintile were 40% more likely to have sufficient nets than those from the lowest.
- Households whose heads were university educated were 2.1 times more likely to have sufficient nets than those without formal education. If a head of household had completed secondary school, its household was 30% more likely to have sufficient nets than one whose head lacked formal education.

Table 1: Households with universal coverage of LLINs

Demographic characteristics	Percentage of households with universal LLIN coverage (95% CI)	
Arm	**Baseline**	**Follow-up**
Control	78.2 (73.5–82.2)	69.6 (65.0–74.1)
Intervention	68.5 (64.4–72.4)	70.7 (68.5–72.9)
Sex of head of household		
Male	67.7 (63.9–71.4)	68.7 (63.9–73.0)
Female	77.2 (72.7–81.2)	76.2 (69.9–81.4)
Age of head of household		
10–29 years	74.2 (68.4–79.3)	65.8 (59.6–71.6)
30–39 years	65.8 (60.5–70.8)	70.0 (63.8–75.5)
40–54 years	70.7 (66.8–74.2)	72.7 (67.8–77.1)
Wealth proxy		
Lowest	63.9 (58.2–69.2)	69.8 (62.7–76.1)
Second	71.0 (65.0–76.4)	62.3 (55.0–69.1)
Middle	73.9 (67.9–79.1)	65.3 (59.9–70.3)
Fourth	69.8 (64.5–74.7)	73.6 (65.7–80.1)
Highest	72.7 (67.3–77.5)	81.7 (76.9–85.7)
Education		
None	71.9 (65.9–77.2)	66.5 (58.3–73.7)
Primary	68.6 (64.5–72.3)	69.9 (65.1–74.2)
Secondary	70.4 (65.8–74.6)	72.4 (66.2–77.8)
University or tertiary	79.2 (70.2–86.0)	86.2 (77.8–91.8)
Total	**70.1 (66.5–73.4)**	**70.5 (66.7–74.3)**

Table 2: Factors associated with universal coverage of LLINs

Demographic characteristics	Odds ratio (95% CI)	p value
DID estimator	1.8 (1.2–2.6)	0.04
Sex of head of household		
Male	Ref	
Female	1.7 (1.4–2.0)	0.01
Age of head of household		
10–29	Ref	
30–39	0.9 (0.7–1.1)	0.31
40–54	1.1 (0.9–1.3)	0.51
Wealth proxy		
Lowest	Ref	
Second	1.1 (0.9–1.3)	0.23
Middle	1.0 (0.8–1.2)	0.95
Fourth	1.1 (0.8–1.2)	0.56
Highest	1.4 (1.1–1.8)	0.01
Education		
None	Ref	
Primary	1.1 (0.9–1.4)	0.17
Secondary	1.3 (1.1–1.6)	0.04
University or tertiary	2.1 (1.4–3.1)	0.01

A pupil receives an LLIN in Bupomboli Primary School

Pupils in Nkarakara Primary School after receiving their LLINs

Conclusion

Our findings suggest that schools are a feasible and acceptable continuous channel via which to distribute LLINs and maintain high coverage. The Ministry of Health should examine using this complementary channel further and at scale.

For more information
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Acknowledgements
Ugandan Ministry of Health
Health facility staff working in MAPD districts
PMI

Reference
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