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Strengthening service delivery for malaria in pregnancy: an mHealth pilot intervention in West Nile, Uganda

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Background: health service delivery & gender mainstreaming

- There are many instances when health programmes need to identify different barriers to receiving quality health care for women and for men, and develop strategies to counter them.
- Women and men often face different risks in contracting diseases.
- There are also different patterns of how women and men access and receive care, due to differing social, economic and educational norms.
- Malaria in pregnancy is a case in point – it affects pregnant women and is typically prevented and controlled through routine antenatal care (ANC).



Background: malaria in pregnancy

- Pregnant women are particularly vulnerable to malaria because of their reduced immunity. They are more susceptible to severe disease and more likely to die from malaria.
- Malaria infection during pregnancy is also harmful to the baby. It increases the risk of miscarriage, as well as pre-term delivery and low birth weight.
- Malaria in pregnancy contributes to up to 25% of maternal deaths and leads to 900,000 low birth weight deliveries each year in Africa.



Background: malaria in pregnancy

- Malaria in pregnancy is preventable.
- The World Health Organization (WHO) recommends a package of interventions for the prevention and treatment of malaria in pregnancy in all areas with moderate to high malaria transmission in Africa:



1. Use of long-lasting insecticidal nets;
2. Intermittent preventive treatment in pregnancy (IPTp);
3. Prompt diagnosis and effective treatment of malaria infections during pregnancy.

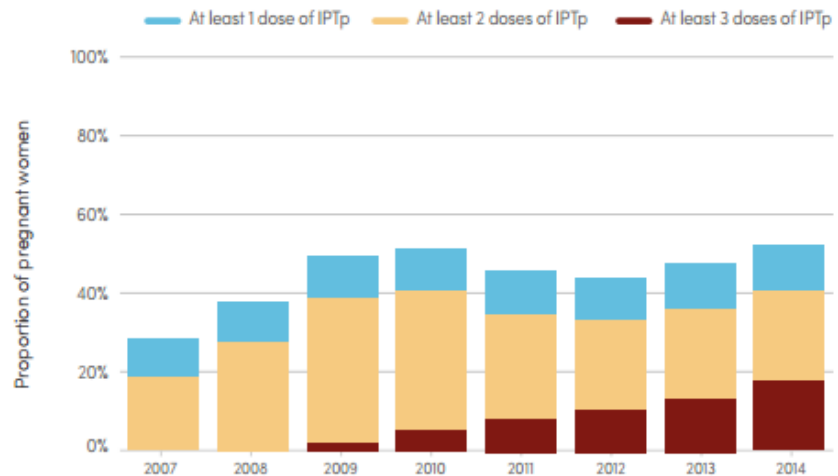
Background: intermittent preventive treatment in pregnancy (IPTp)

- IPTp entails administration of a curative dose of an antimalarial drug to all pregnant women, regardless of whether or not the recipient is infected with malaria.
- The drug used for IPTp is called sulfadoxine-pyrimethamine (SP).
- WHO recommends administration of IPTp at each ANC visit, except during the first trimester and provided that doses are given one month apart.
- In practice, this means most women should receive three to four doses of IPTp over the course of their pregnancy.



Background: IPTp uptake

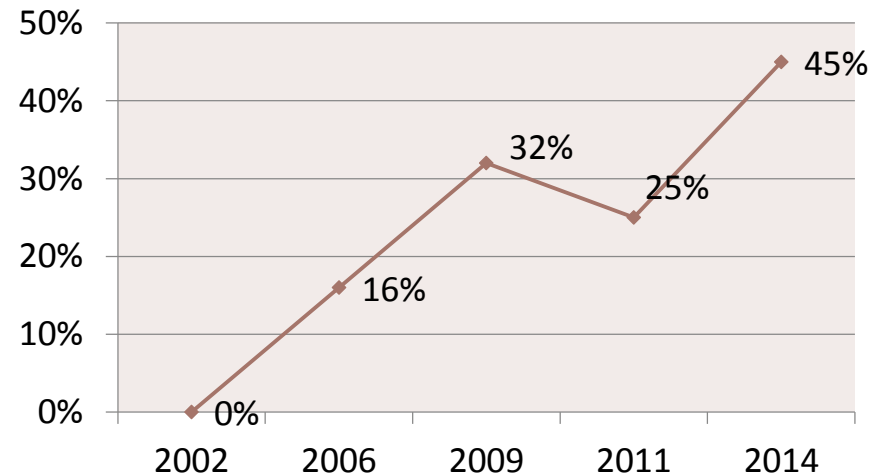
- Even though ANC coverage in African countries is generally high, many countries have struggled to achieve high levels of uptake of IPTp.
- In Uganda, about 90% of women attend ANC at least twice, while only 45% of women receive at least two doses of IPTp, suggesting that opportunities for the provision of IPTp are being missed.



IPTp, intermittent preventive treatment in pregnancy

Source: WHO estimates using national malaria control programme reports and United Nations population estimates

Fig 1. Uptake of IPTp by dose in sub-Saharan Africa



Source: Uganda Demographic and Health Surveys & Malaria Indicator Surveys

Fig 2. Uptake of at least two doses of IPTp in Uganda

Barriers to IPTp uptake in malaria: formative research (2013-14)

Research question:

What are the barriers to women receiving or taking IPTp during ANC?

- Supply side: resources, policies, stakeholders, capacity building, provision of services
- Demand side: accessibility, affordability, acceptability

Study design:

- Qualitative: 45 in-depth interviews with district health staff, health workers, community leaders, pregnant women/mothers

Study setting

Four districts in Eastern and West Nile regions

Barriers to IPTp uptake in malaria: formative research results

Conclusions:

- Women and communities have largely positive views of ANC and IPTp.
- Supply-side challenges are likely to account for the majority of missed opportunities for the provision of IPTp.

¹Rassi C, Graham K, King R, Ssekitooleko J, Mufubenga P, Siduda Gudoi S. [Assessing demand-side barriers to uptake of intermittent preventive treatment for malaria in pregnancy: a qualitative study in two regions of Uganda](#). *Malaria Journal*. 2016;15(1):530.

²Rassi C, Graham K, Mufubenga P, King R, Meier J, Gudoi SS. [Assessing supply-side barriers to uptake of intermittent preventive treatment for malaria in pregnancy: a qualitative study and document and record review in two regions of Uganda](#). *Malaria Journal*. 2016;15(1):341.

Main findings: demand side¹

- Some concerns over taking SP on an empty stomach and mild side effects
- Women tend to accept IPTp if offered and encouraged by a health worker

Main findings: supply side²

- Inadequate knowledge of IPTp guidelines and poor provision practices among health workers
- Guidelines ambiguous and not up-to-date, implying a maximum of two doses of IPTp

Pilot study: objectives & design

Objectives:

1. Improve health worker performance with regard to IPTp provision;
2. Increase coverage of IPTp.

Intervention components:

1. Classroom training on malaria in pregnancy (including updated IPTp provision guidelines) for health workers in two districts;
2. Sending a series of educational text messages reinforcing the training content to health workers in one of the two districts.

Research question:

Is complementing classroom training with sending text messages a feasible and acceptable intervention which has the potential to improve health worker performance and increase coverage of IPTp?

Pilot study: setting

- The pilot study was conducted in two districts of West Nile.
- In each district, eight health facilities (public and private not-for-profit) were selected for inclusion in the study.
- Health workers at participating health facilities in one district received classroom training followed by text messages ('intervention'), while health workers in the other district only received classroom training ('control').

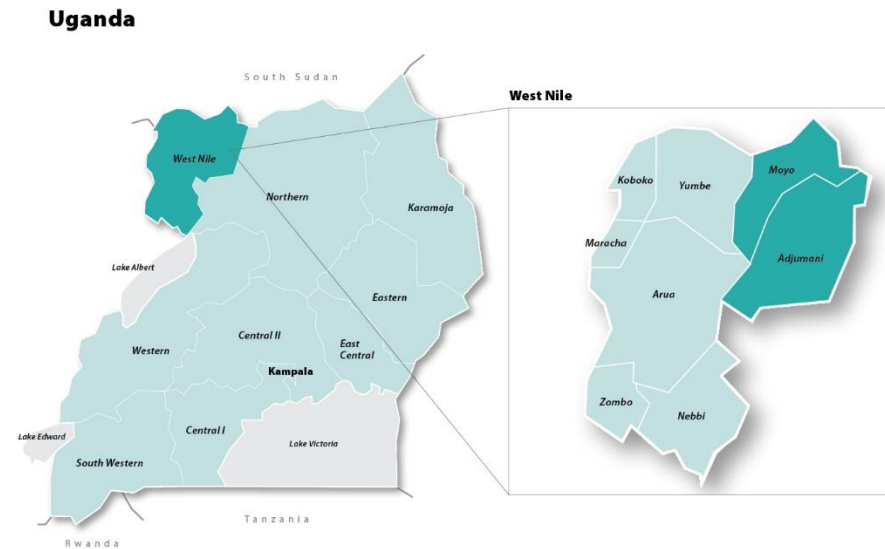


Fig 3. Study districts.

Pilot intervention: classroom training & text messaging

- The training followed the standard approach of selecting a group of health workers to attend the training and tasking them with cascading information to colleagues who did not attend ('cascade approach').
- In each district, 24 health workers with responsibility for ANC from the eight participating health facilities attended a three-day training.
- A total of 24 text messages were sent to *all* health workers with responsibility for ANC at the eight participating health facilities in the intervention district (n=49).
- One message was sent every weekday over a period of five weeks to health workers' personal mobile phones.
- Messages were sent via mTrac, an SMS platform owned by the Ministry of Health and typically used to text information from health facilities (e.g. stock levels) to the district health office.

Pilot intervention: sample text messages

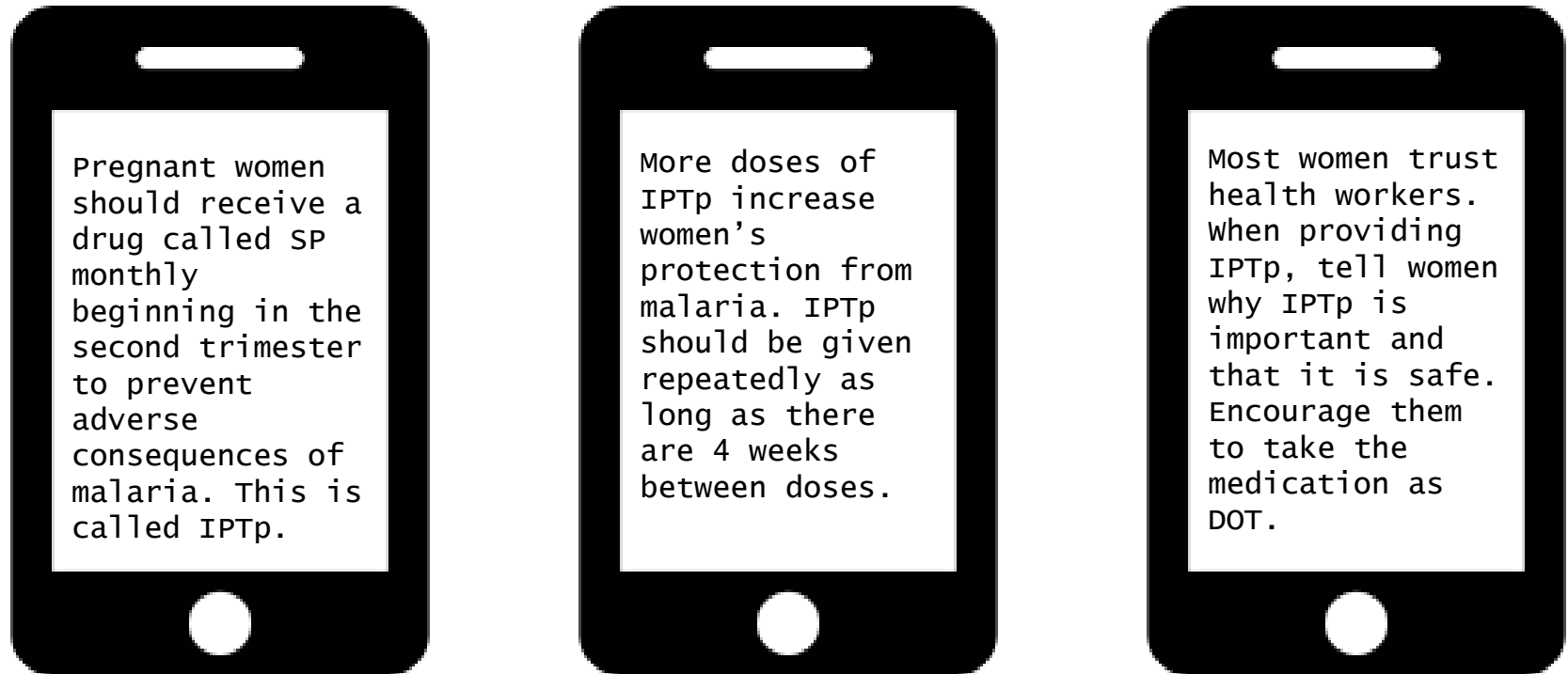


Fig. 4. Sample text messages.

Pilot intervention: evaluation

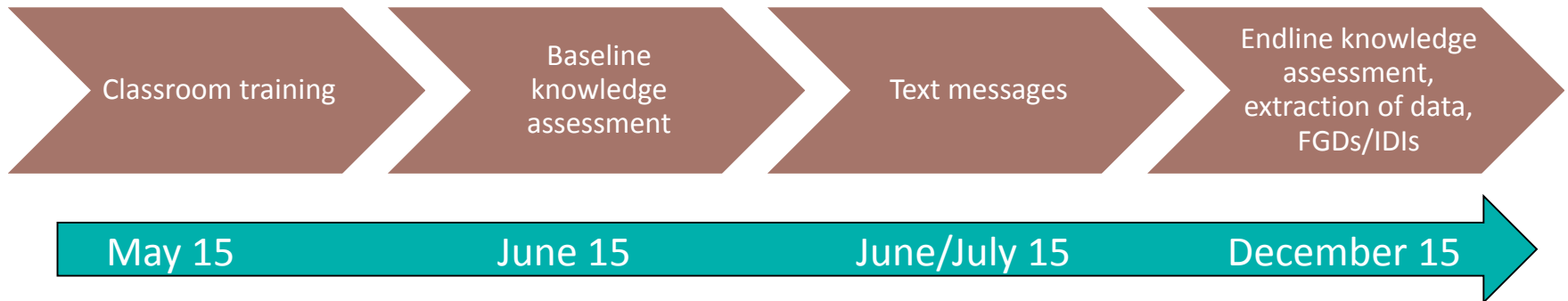
The evaluation used a convergent mixed-methods design:

Table 1. Evaluation foci and data sources.

Focus of evaluation	Data source
Health worker knowledge of IPTp	Knowledge assessment (using a multiple-choice questionnaire) one month after ('baseline') and six months after the classroom training ('endline')
IPTp coverage	Extraction of data from participating health facilities' ANC registers covering six months before and after the classroom training
Feasibility and acceptability	<ul style="list-style-type: none">• 4 focus group discussions (FGDs) with health workers• 3 in-depth interviews (IDIs) with district health staff

Pilot intervention: timeline

Intervention



Control

Fig. 5. Timeline of study activities.

Health worker knowledge: results

- At baseline, there was no statistically significant difference between control and intervention.
- At endline, however, the mean score in the intervention had improved compared with the baseline and was now significantly higher than in the control, where it had decreased.
- The difference-in-difference between control and intervention at baseline and endline was statistically significant, indicating that combining classroom training and text messaging resulted in better knowledge and knowledge retention compared with classroom training only.

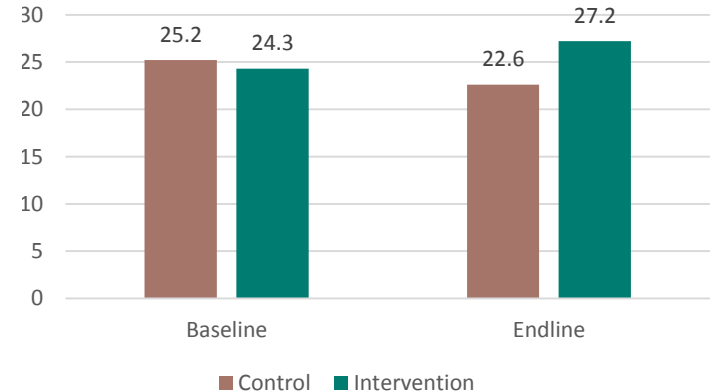


Fig. 6. Mean knowledge scores at baseline and endline.

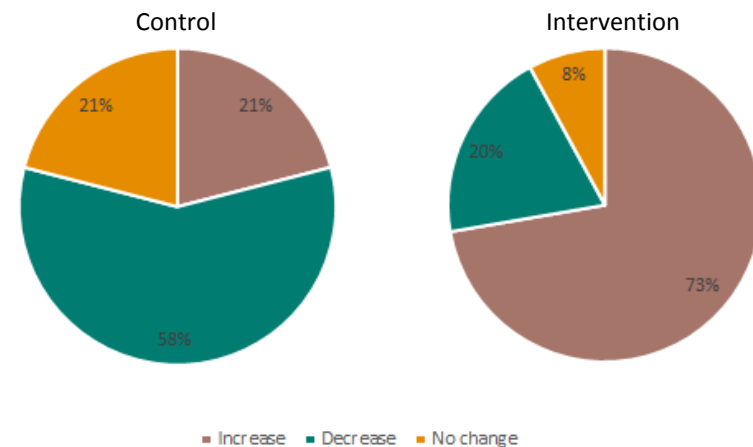


Fig. 7. Change in individuals' knowledge scores (baseline and endline).

IPTp coverage: results

- Coverage of all doses of IPTp increased in both districts after the training.
- The increase in IPT3 and IPT4 was noticeably greater in the intervention, suggesting that classroom training plus text messaging resulted in better IPTp coverage than classroom training only.

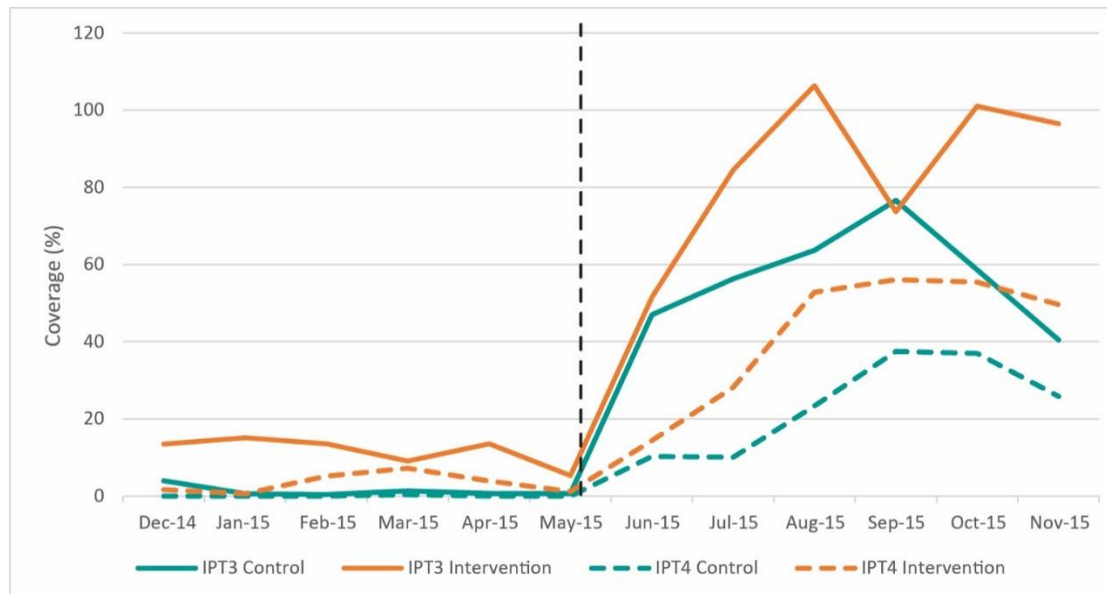


Fig. 8. IPT3 and IPT4 coverage pre-/post-classroom training.

Feasibility and acceptability: results

- Cascading of training information did not happen consistently.
- All health workers owned a personal mobile phone.
- Technical issues appeared to delay rather than preclude reception of messages.
- Health workers generally stated that the messages were helpful in reinforcing the training content.
- The messages were also seen as helpful because they reached those who did not attend the classroom training.
- Frequency of the messages was seen as adequate.

“Those who attended the training just told us they had a training, but details about it were not discussed.”

Health worker, control

“They are a good idea because most times people after the training, they tend to forget. But once the messages are forwarded to them, they remember -- ah this was taught. So it [was] helpful.”

Health worker, intervention

Feasibility and acceptability: results

- Sending the messages did not pose significant challenges to district staff, as a familiar system, mTrac, was used.
- District health officials also pointed out the low cost of the intervention. The only activity cost associated with the text messages was an mobile internet allowance (approx. £18) to enable remote access to the mTrac system while travelling in the field.

“It is part of what I do, so I feel that I was doing my due responsibilities. So I feel it didn’t do any additions to this.”

Biostatistician, intervention

Limitations

The study was designed as a pilot. Small sample size and lack of randomisation mean it is not possible to conclusively attribute outcomes in terms of health worker knowledge and IPTp coverage to the intervention.

Conclusion

- Strengthening service delivery is an important factor in improving quality of care for pregnant women.
- Improving health worker performance is a key success factor for strengthening service delivery.
- Complementing conventional health worker training on malaria in pregnancy with sending educational text messages was a feasible approach which was very well accepted by health workers and district officials.
- There are also strong indications that the approach resulted in improved health worker performance and increased coverage of IPTp.



Acknowledgements

The study was conducted through COMDIS-HSD, a Research Programme Consortium funded by the UK government. It also received Programme Partnership Arrangement funding from the UK government. However, the views expressed do not necessarily reflect the UK government's official policies.

Many of the projects undertaken under COMDIS-HSD have exemplified the importance of gender mainstreaming during health intervention design and assessment. A policy brief outlines some relevant issues and examples³.

³COMDIS-HSD. *Why gender mainstreaming is important when planning and implementing health interventions: examples from COMDIS-HSD*. Leeds, UK; 2015.



Thank you



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