

A conversation with Patrick Sieyes and Caroline Desrousseau, January 12, 2017

Participants

- Patrick Sieyes – Regional Director, Head of Africa and Middle East, Vestergaard
- Caroline Desrousseau – Global Accounts Manager, Vestergaard
- Josh Rosenberg – Senior Research Analyst, GiveWell

Note: These notes were compiled by GiveWell and give an overview of the major points made by Mr. Patrick Sieyes and Ms. Caroline Desrousseau.

Summary

GiveWell spoke with Mr. Sieyes and Ms. Desrousseau of Vestergaard about product development in the malaria control space, and the testing and approval of new long-lasting insecticide-treated bed nets (LLINs). Conversation topics included the prevalence and impact of insecticide resistance in Africa, the cost of LLINs, and barriers to the development of next-generation LLINs.

Insecticide resistance

Insecticide resistance appears to be prevalent in mosquitoes in many African countries, including Kenya, Rwanda, Zambia, Malawi, and Mozambique. Levels of resistance appear to be especially high in West Africa, and it is likely that the standard pyrethroid-class LLINs used there may not offer the intended efficacy for LLINs established under the World Health Organization's Pesticide Evaluation Scheme (WHOPES).

Possible impact on malaria rates

World Malaria Report 2016

Mr. Sieyes is concerned about the patterns he is seeing in the country-level malaria incidence data collected in the 2016 World Health Organization (WHO) World Malaria Report. The report generally shows decreases in malaria cases over the past 15 years. However, in the past five years, incidence rates have not decreased as sharply in many countries. In the last few years – despite large-scale interventions and increased spending on malaria prevention and diagnosis – malaria incidence rates have remained the same or have increased in some countries, such as Mozambique, Mali, Burkina Faso, Benin, Malawi, Rwanda, Kenya.

This pattern could suggest that the current tools for preventing malaria may be reaching the limits of their efficacy; for example, insecticide resistance may be negating the impact of standard LLINs.

Studies on insecticide resistance and malaria control

- **AMF-funded Uganda study** – The Against Malaria Foundation’s (AMF) large-scale LLIN campaign in Uganda – which includes a large deployment of next-generation LLINs treated with piperonyl butoxide (PBO) – will be an important test of next-generation LLINs. A recent large outbreak of malaria in 10 northern districts of the country has led to approximately one million cases of malaria and 12,000 malaria deaths, and the situation has not improved since the outbreak started, with another 10 districts experiencing similar trends. However, it is possible that results from this study will not be publicly available for two to three years. In three years, the results may show that PBO LLINs offer significant improvement over standard LLINs, but malaria rates may continue to rise over that time period. Ideally, the global community would be able to determine whether PBO nets should be deployed sooner than a few years from now.
- **Tanzania randomized controlled trial (RCT) on PBO LLINs** – Vestergaard is particularly interested in the aspect of this study that examines the use of PBO LLINs in conjunction with Actellic insecticide. WHO recommended that these products should not be used together, but Mr. Sieyes believes there is insufficient data to support this position and feels that PBOs should not be excluded from areas where Actellic is also being used.

This year’s Alliance for Malaria Prevention annual meeting could be a good opportunity to discuss the Uganda and Tanzania next-generation LLIN studies. Last year, the meeting provided a forum for the LLIN community to begin discussing the situation in Uganda. This year, Vestergaard is interested in raising the question of whether the next-generation LLIN studies’ results – when they become available – will be sufficient to effect policy change, or whether more action should be taken to address the issue of insecticide resistance.

Additional studies on next-generation LLINs

While the Uganda study is an important step in understanding the impact of next-generation LLINs, Vestergaard believes that additional studies at scale should be performed in other African countries in the near term. Because of differences in the vector ecology and malaria epidemiology of Western, Eastern, and Southern Africa, the effect of PBO LLINs in Uganda is unlikely to be representative of all of Africa.

Mozambique is a strong candidate for an additional trial of PBO LLINs, for the following reasons:

- It is located in Southern Africa.
- There has been significant effort to reduce malaria in Mozambique.
- The level of insecticide resistance in the country is high, on par with Uganda.
- The type of insecticide resistance found in Mozambique – as well as other Southern African countries, e.g., Malawi and Zambia – is exclusively metabolic resistance, for which PBO is well suited. In Uganda, there are many other types of resistance.

Gathering more data at scale is needed to help effect policy change.

Cost of LLINs

Quality issues

Since there is pressure to minimize the price of LLINs, the overall quality of LLINs in the system is decreasing and there are now some countries receiving substandard LLINs.

AMF appears to be aware of this trend and maintains strict requirements for the quality of LLINs used in its campaigns.

Cost-effectiveness of standard versus next-generation nets

If community protection from LLINs is lost as a result of insecticide resistance, then the cost of standard LLINs only goes toward providing personal protection. Next-generation LLINs that are more effective in mosquito populations exhibiting insecticide resistance have the potential to be more cost-effective since they could still offer community-level protection (i.e. provide protection even for those not covered by LLINs).

Barriers to adoption of next-generation LLINs

Innovating on LLINs

Vestergaard does not see a straightforward path to market for new LLIN products. It developed the PermaNet 3.0 PBO LLIN ten years ago and has had to advocate for the adoption of this product ever since. While it is encouraging that this PBO LLIN is now being deployed on a large scale in Uganda, there are many other countries that could potentially benefit from this product.

Vestergaard is concerned that others do not seem to be working on innovations in this space. It is interested in continuing to innovate on malaria vector control solutions, but a viable path for product release and adoption is necessary before it considers investing in commercialization of projects beyond PermaNet 3.0. Vestergaard is interested in discussing how philanthropy could potentially help fill this innovation gap.

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