Comparative life cycle assessment of Long-Lasting Insecticidal Nets

Objective

- Assess *LifeNet*® mosquito net environmental profile through its whole life cycle and compare it with two other types of mosquito nets.
- Identify improvement areas and assess the human health benefit related to the Long Lasting Insecticidal Nets (LLIN) use.

Quantis Solution

Assess the environmental performance of *LifeNet* (global warming, resource consumption, impact on ecosystem quality and human health, water withdrawal). Use of IMPACT 2002+[1] and USEtox[2] model.

Compare *LifeNet* with two other mosquito nets in polyethylene and polyethylene terephthalate materials through an ISO compliant Life Cycle Assessment study.

Provide an assessment of the mosquito nets use phase benefits on human health (protection from mosquito bites and therefore from malaria).

Support Bayer in developing an Environmental Product Declaration (EPD) document (more information on www.vectorcontrol.bayer.com)

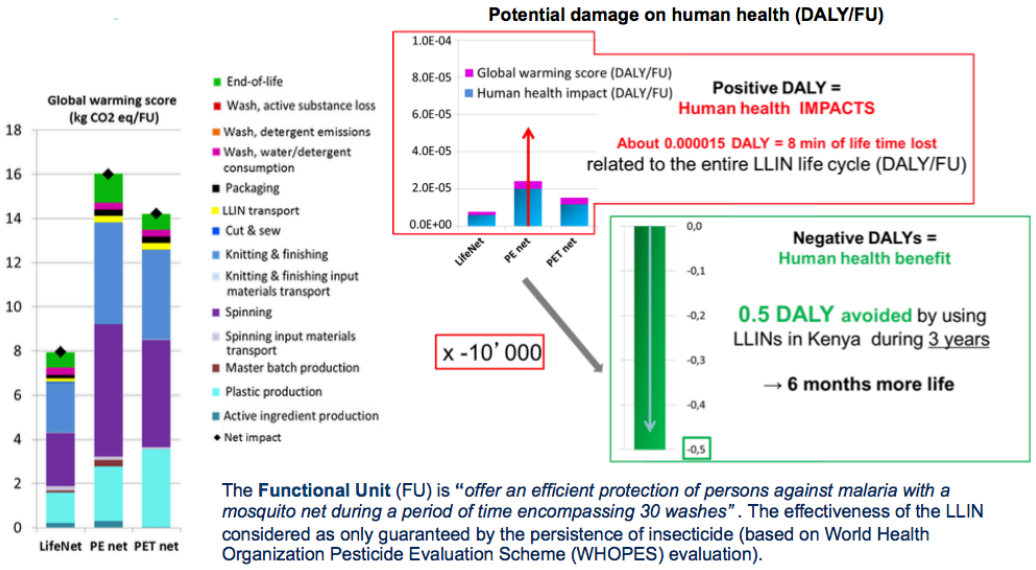
[1]Peer reviewed and internationally recognized Life Cycle Impact Assessment (LCIA) methodology.
[2]UNEP SETAC Toxicity (USEtox) characterization model for human and ecotoxicological impact category.

"We have chosen Quantis for its environmental expertise and its capacity to support us on results communication "

Laurent Dini
Sustainable Development Manager
Environmental Science Division

Bayer CropScience

Results



The **Functional Unit** (FU) is "*offer an efficient protection of persons against malaria with a mosquito net during a period of time encompassing 30 washes*". The effectiveness of the LLIN considered as only guaranteed by the persistence of insecticide (based on World Health Organization Pesticide Evaluation Scheme (WHOPES) evaluation).

- The most impacting life cycle stage regarding the 5 impacts assessed is the production of the net. The energy consumption during the spinning and the knitting & finishing steps and the plastic production are together the main contributors.
- Potential damage on human health avoided (DALYs[3] avoided) by using a mosquito net during 3 years (-0.5 DALY) are about five orders of magnitude (factor 10'000) higher than the potential impacts generated on human health due to their production, use and disposal (an average of 1.5 DALY/FU).

Quantis

Key findings

- The best environmental performance for *LifeNet* is due to (1) the higher washing resistance of the nets and (2) the lower electricity consumption related to the type of plastic used and to the process optimization.
- The study also showed the importance of the good practices related to the mosquito net washing to avoid impact on ecosystem quality (insecticide pollution).
- Use phase appears to be a significant contributor to two impact categories (human health impact and water withdrawal) - due to the detergent and water use.

Client's actions

- Increase communication programs on safe mosquito net use, including the management of mosquito net packaging to avoid inadequate practices.
- Publish an Environmental Product Declaration in collaboration with Quantis.