The useful life of a mosquito net and its impact on distribution strategies

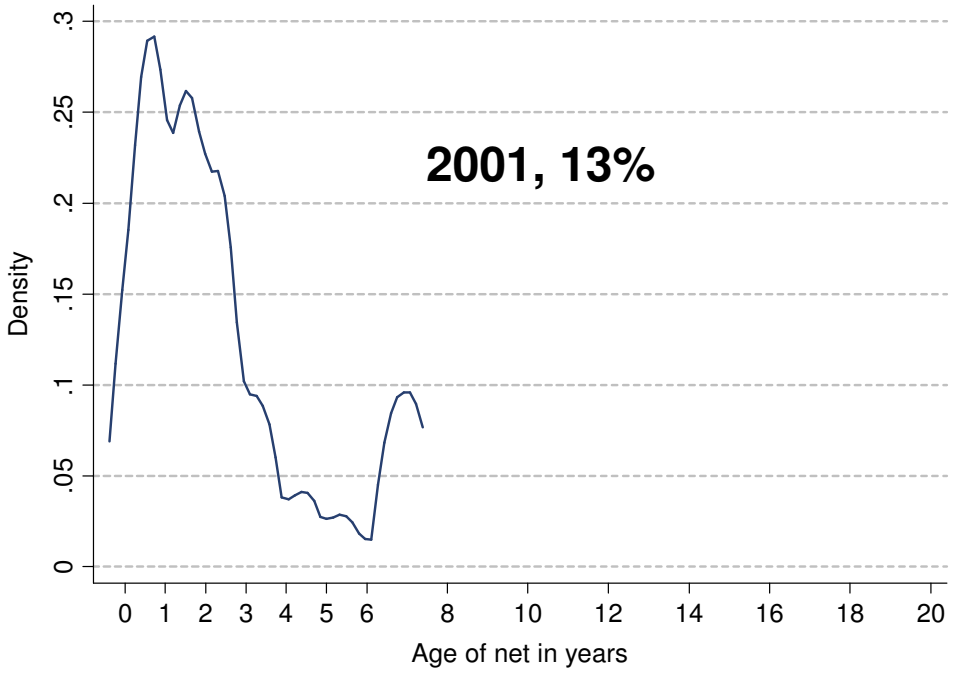
Albert Kilian

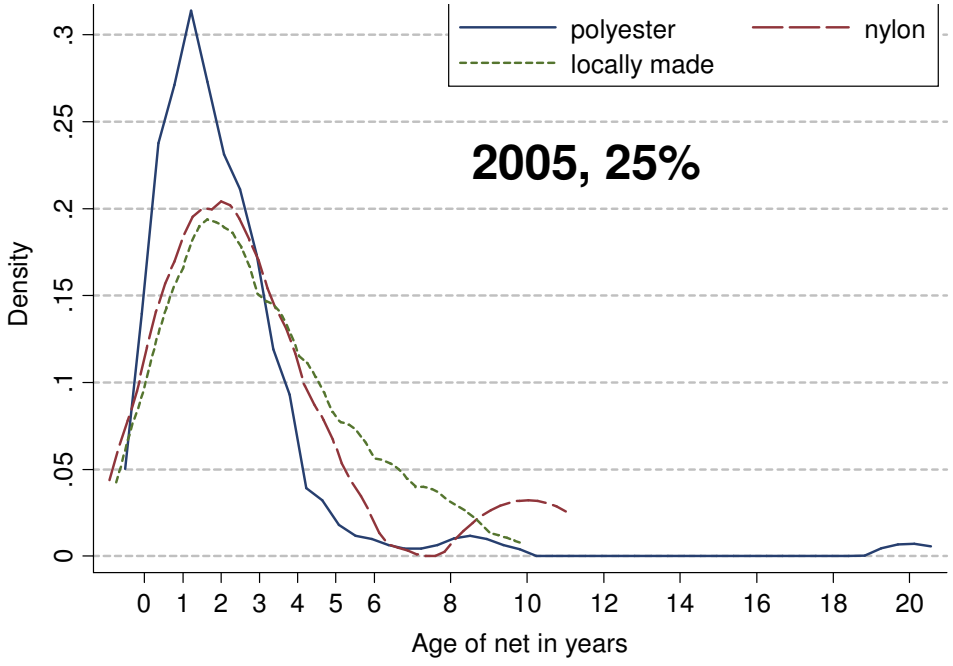
Useful life of a net

- There is very limited hard evidence on the useful life of a mosquito net
- It is likely to be more complex than we would like
- Can be separated into two components
  - The physical decay of the net
    - 3 types of holes: tear, burn, rodents
  - Replacement of the net
    - depends of physical condition
    - but also availability of replacement, perception

Useful life of a net

- Data from projects may not be representative for the “real life” situation, i.e. overestimates
- Not likely to be a linear function of time but rather slow first, than rapid with long tale
- Likely to differ with socio-economic status
- Likely to change over time as net culture develops and use patterns adjust



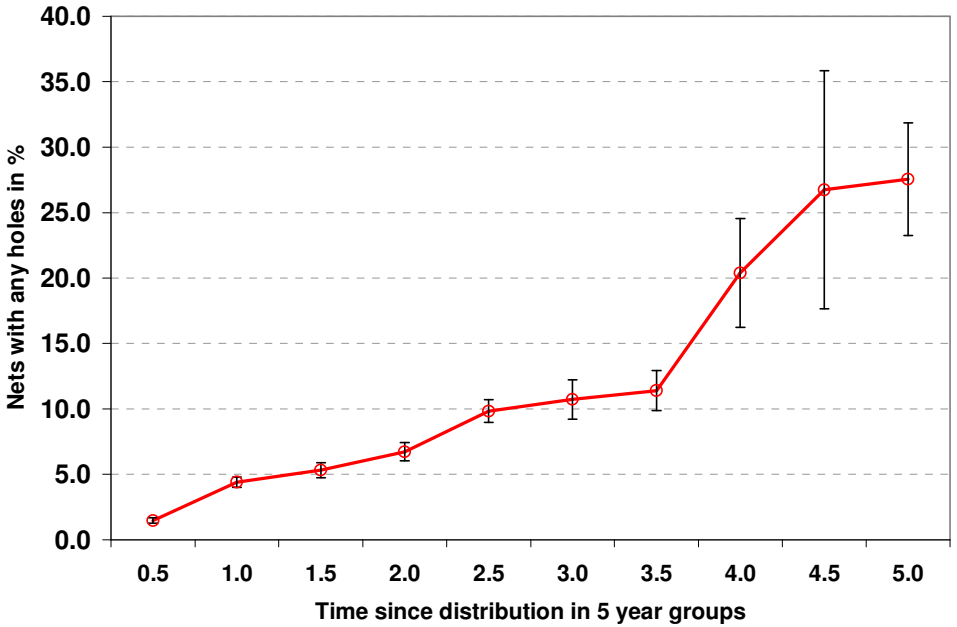


- "age of nets" from surveys biased by rate of acquisition
- But declining arm seems to be dominated by "loss" of net
- Average net survival 1-3 years (polyester nets) ?

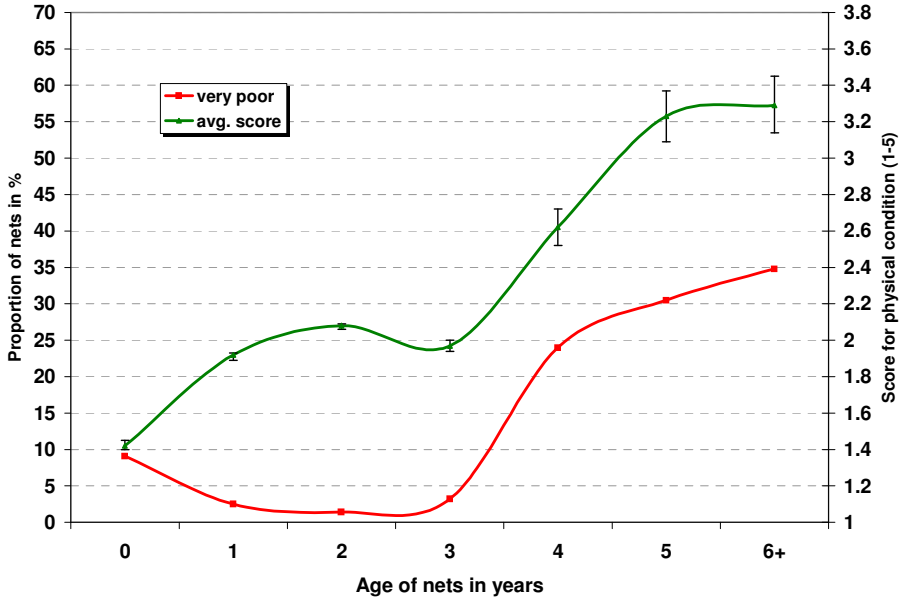
Useful life of a net

- Rate of physical “decay” accelerates after ~3 years
- Some evidence that nets with more holes used less

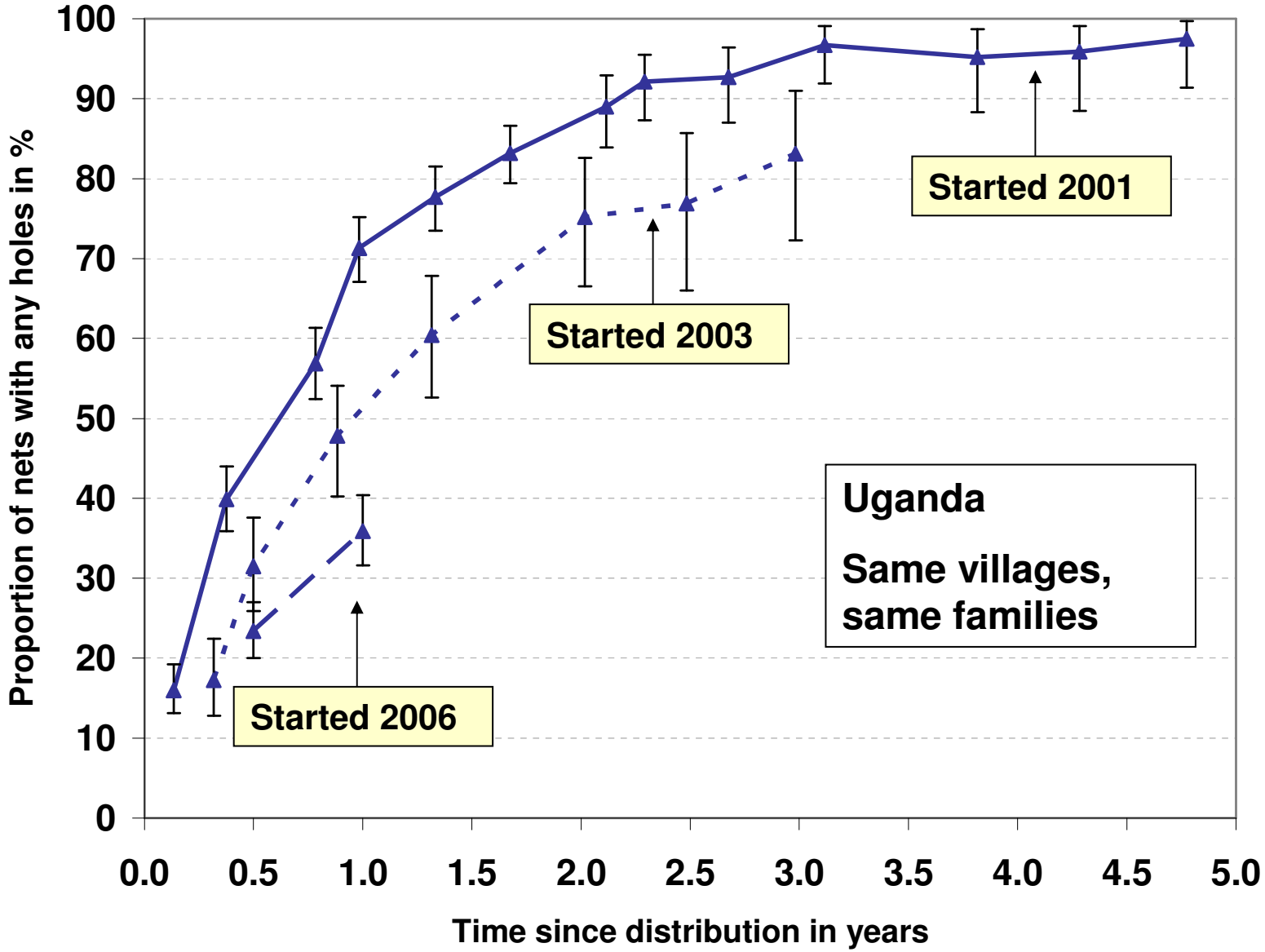
Uganda



Mozambique



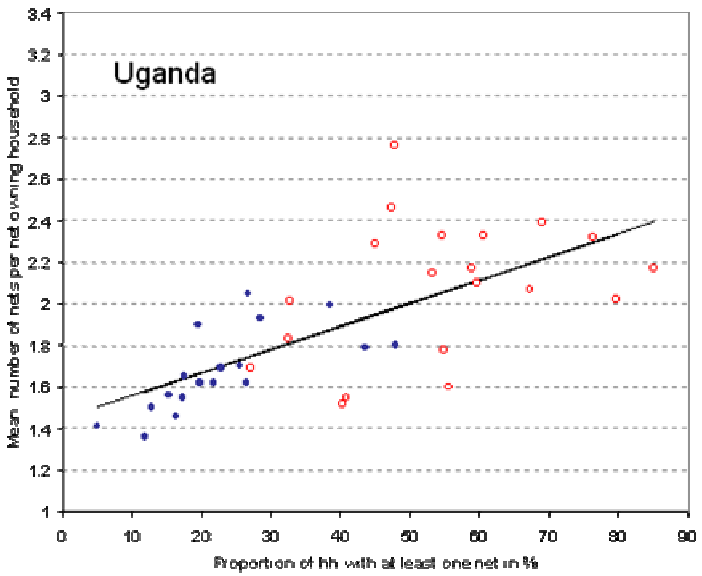
- As net culture build, people treat net more carefully

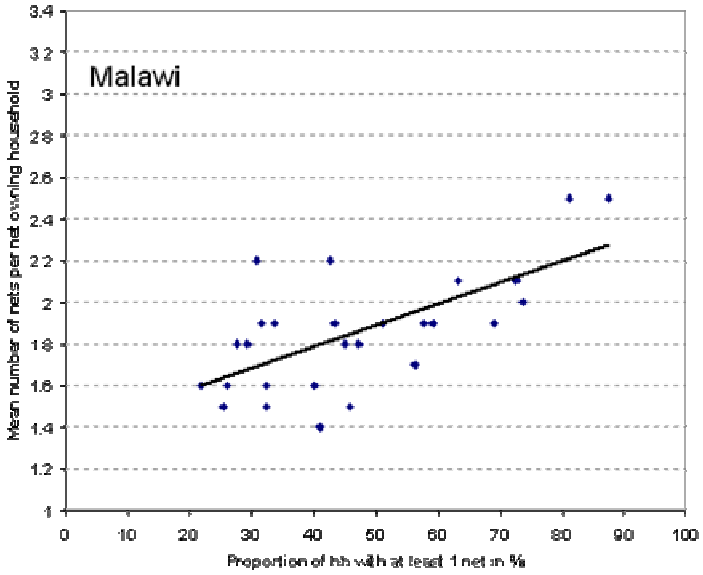


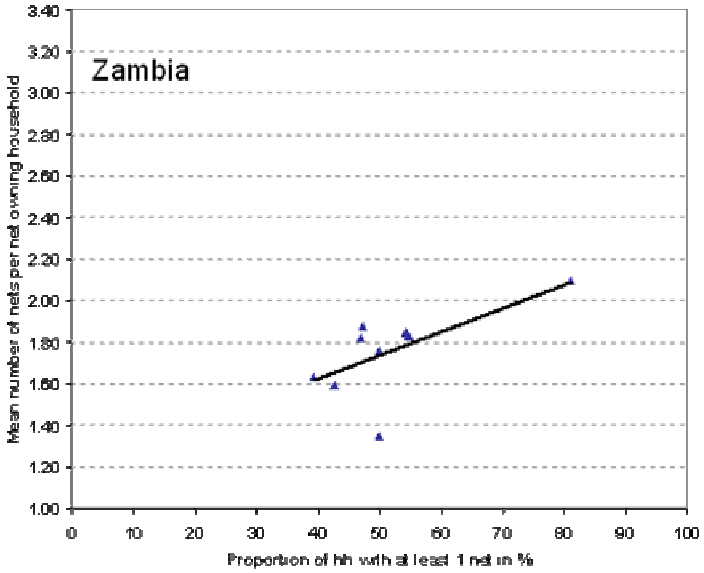
Incorporating dynamic loss of nets into projection of nets needed

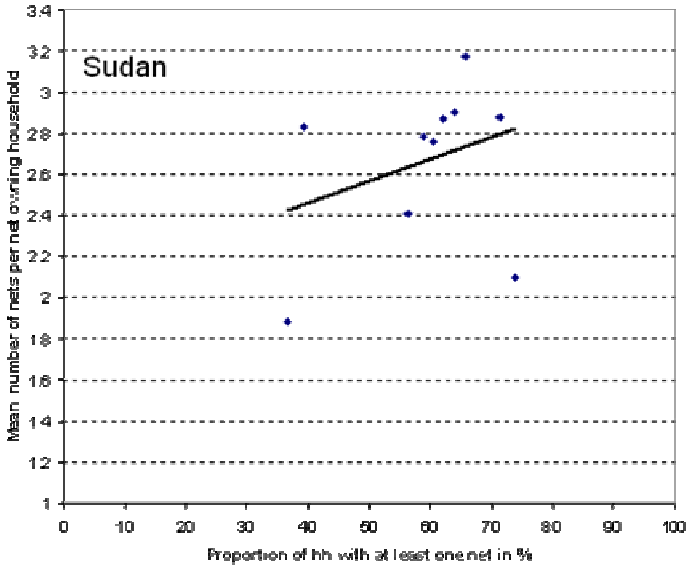
- Simple compartimental model relating number of nets to household coverage
  - To estimate net coverage from actual input data
  - To estimate nets needed and coverage achieved over time in different distribution scenarios

- Model builds on relationship between mean nets per net owning households and net coverage rate



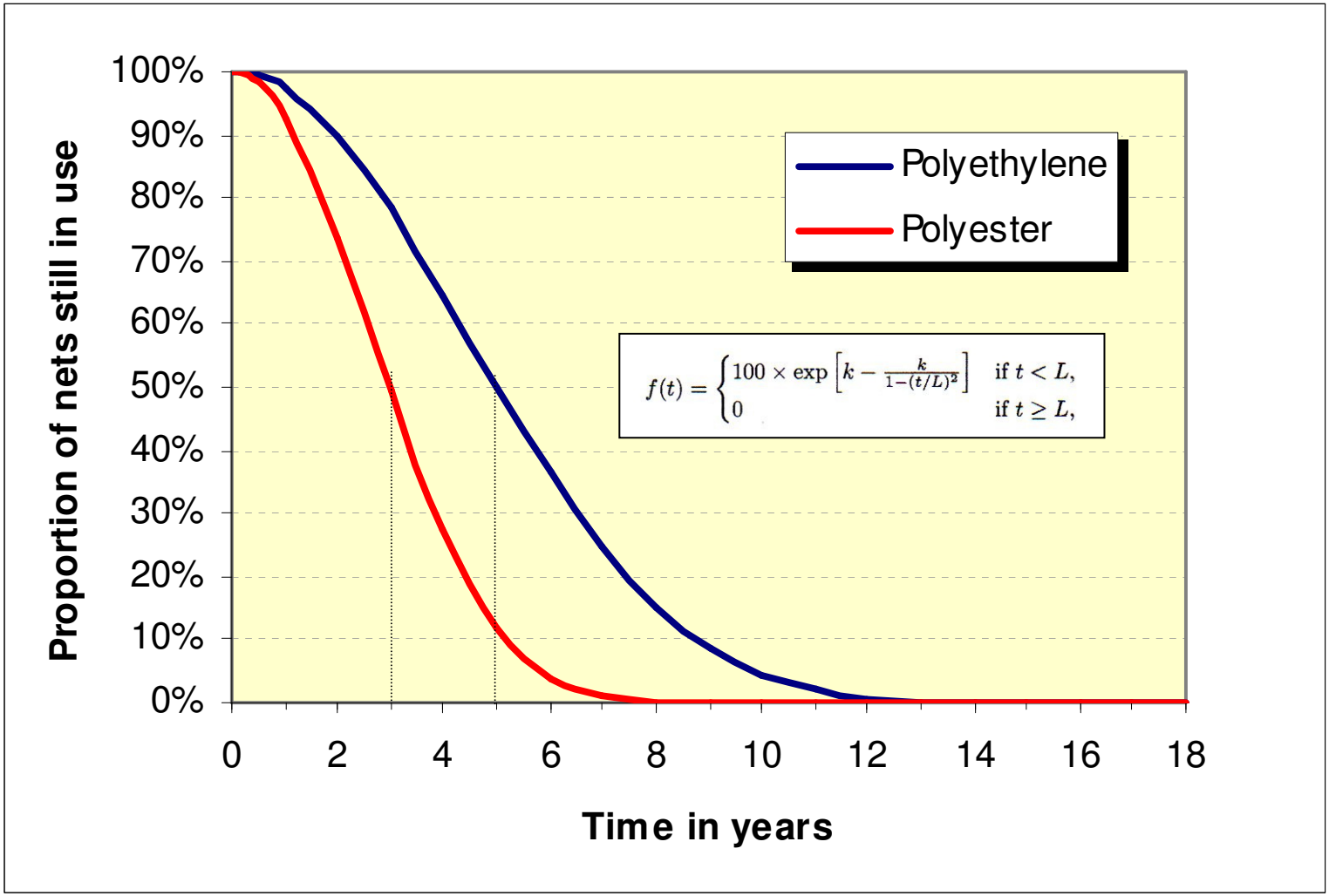






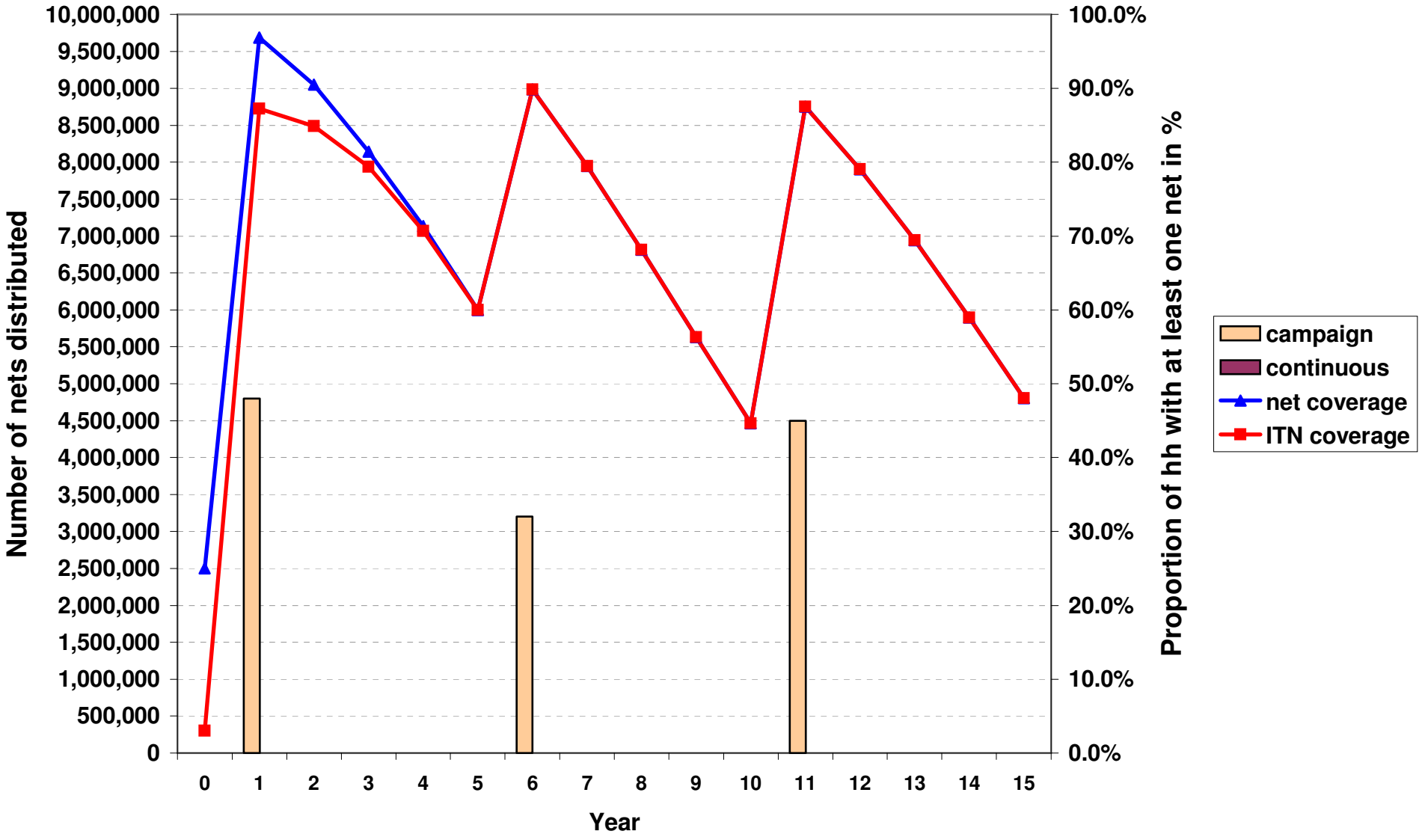
- Incorporates dynamic loss function for two types of nets

The mathematical function was developed by Nakul Chitnis, STI



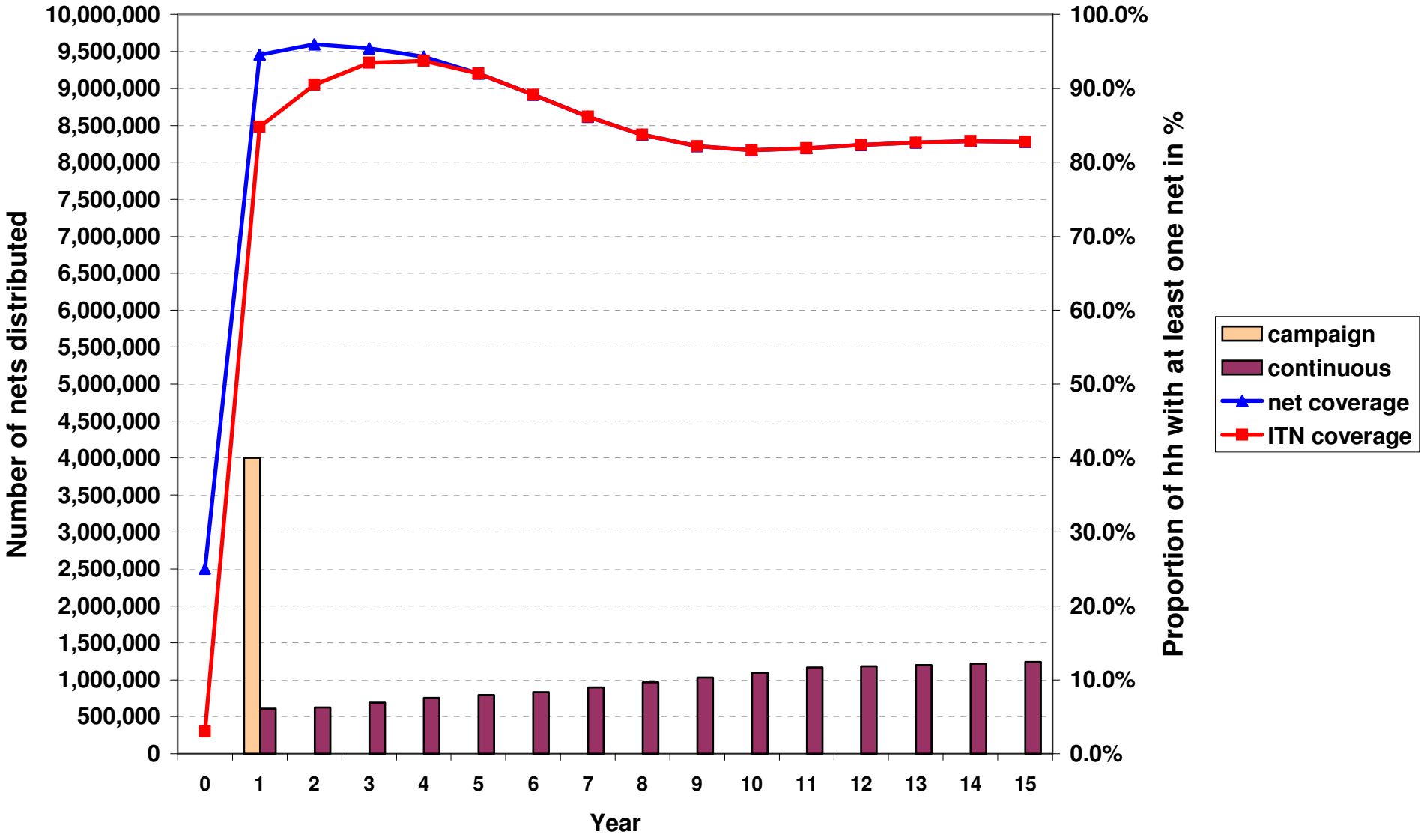
"5 year" LLIN

Population 10 million 25% nets, 3% ITN at start, 12.5 million LLIN distributed



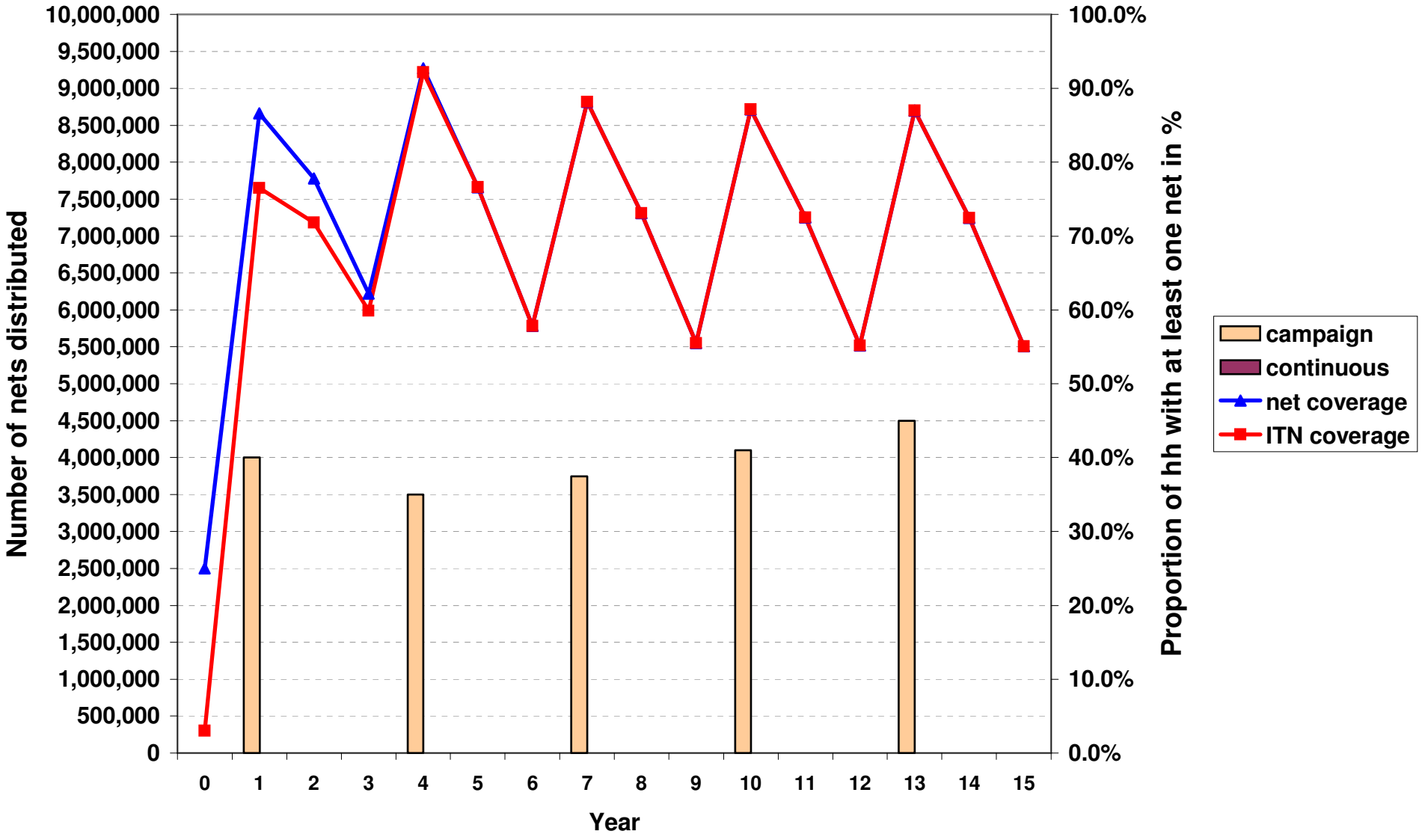
"5 year" LLIN

Population 10 million 25% nets, 3% ITN at start, 18.3 million LLIN distributed



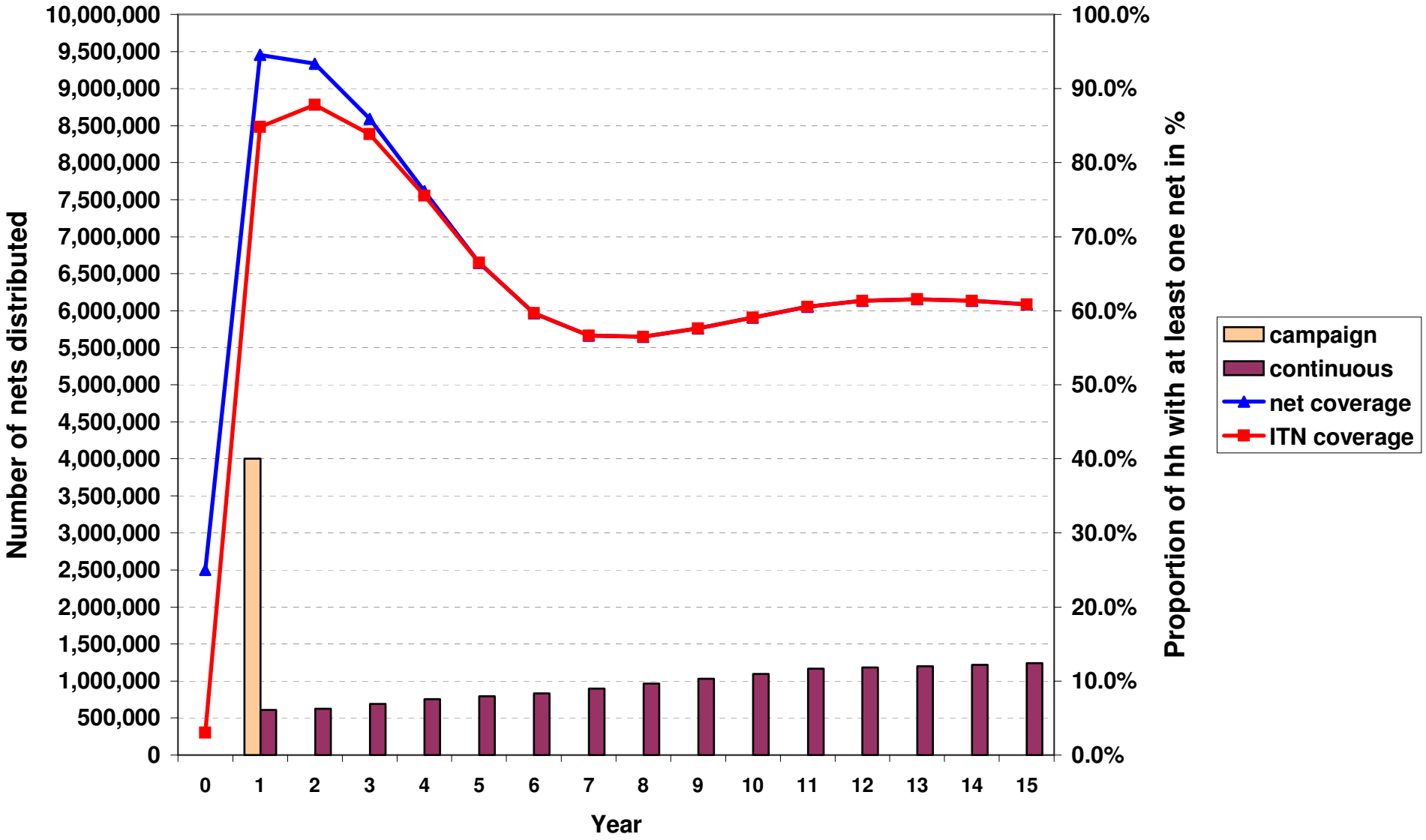
"3 year" LLIN

Population 10 million 25% nets, 3% ITN at start, 19.8 million LLIN distributed



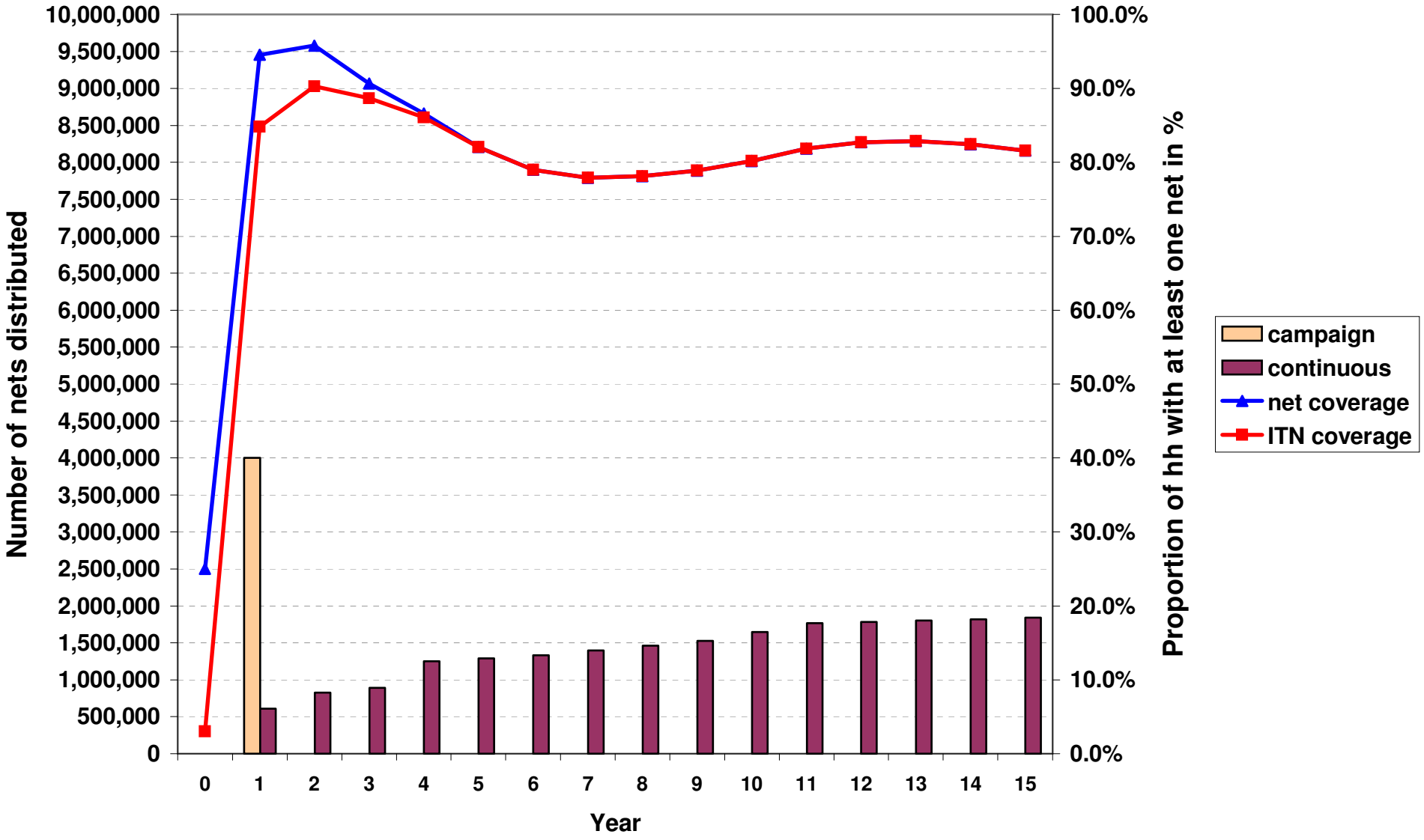
"3 year" LLIN

Population 10 million 25% nets, 3% ITN at start, 18.3 million LLIN distributed



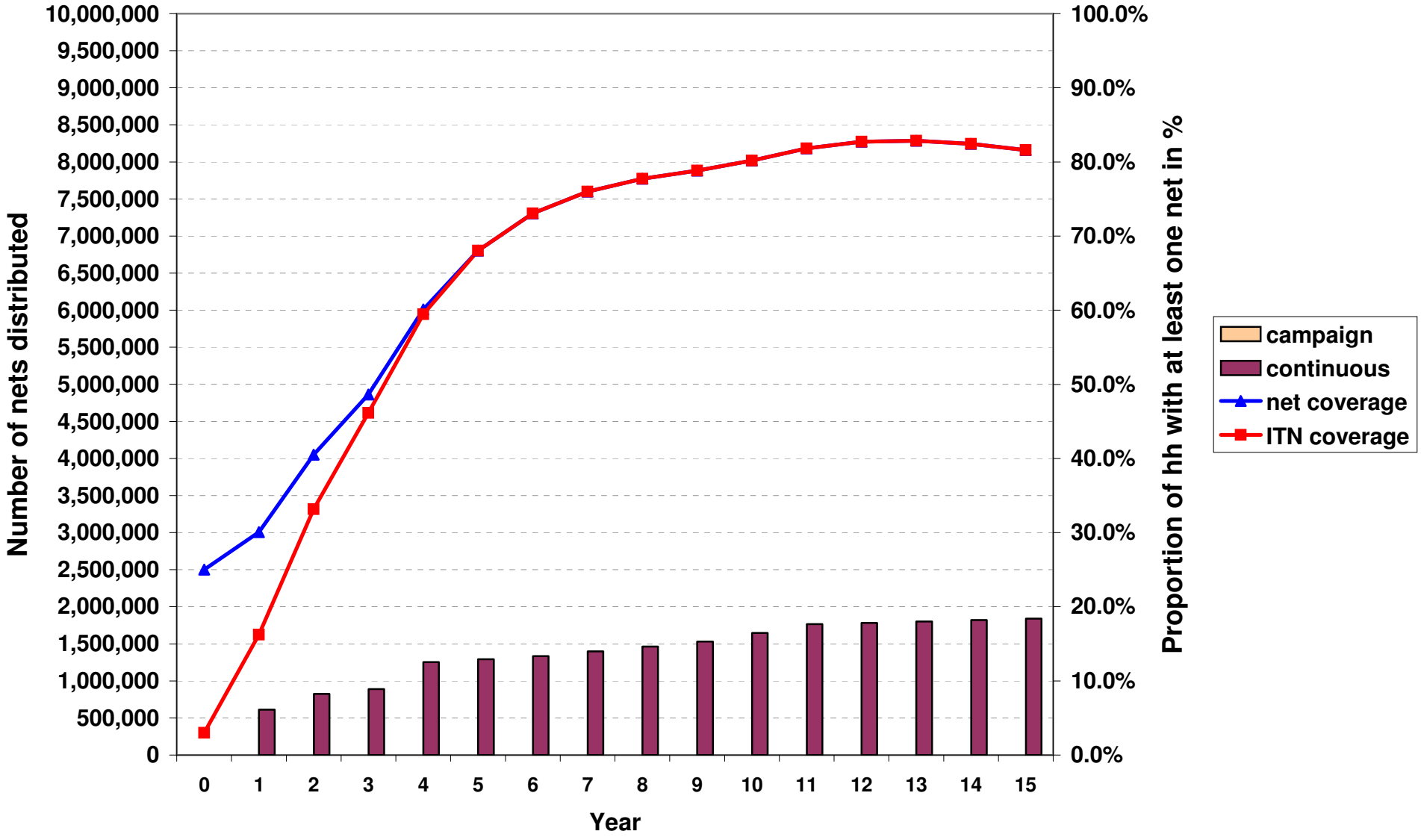
"3 year" LLIN

Population 10 million 25% nets, 3% ITN at start, 25.2 million LLIN distributed

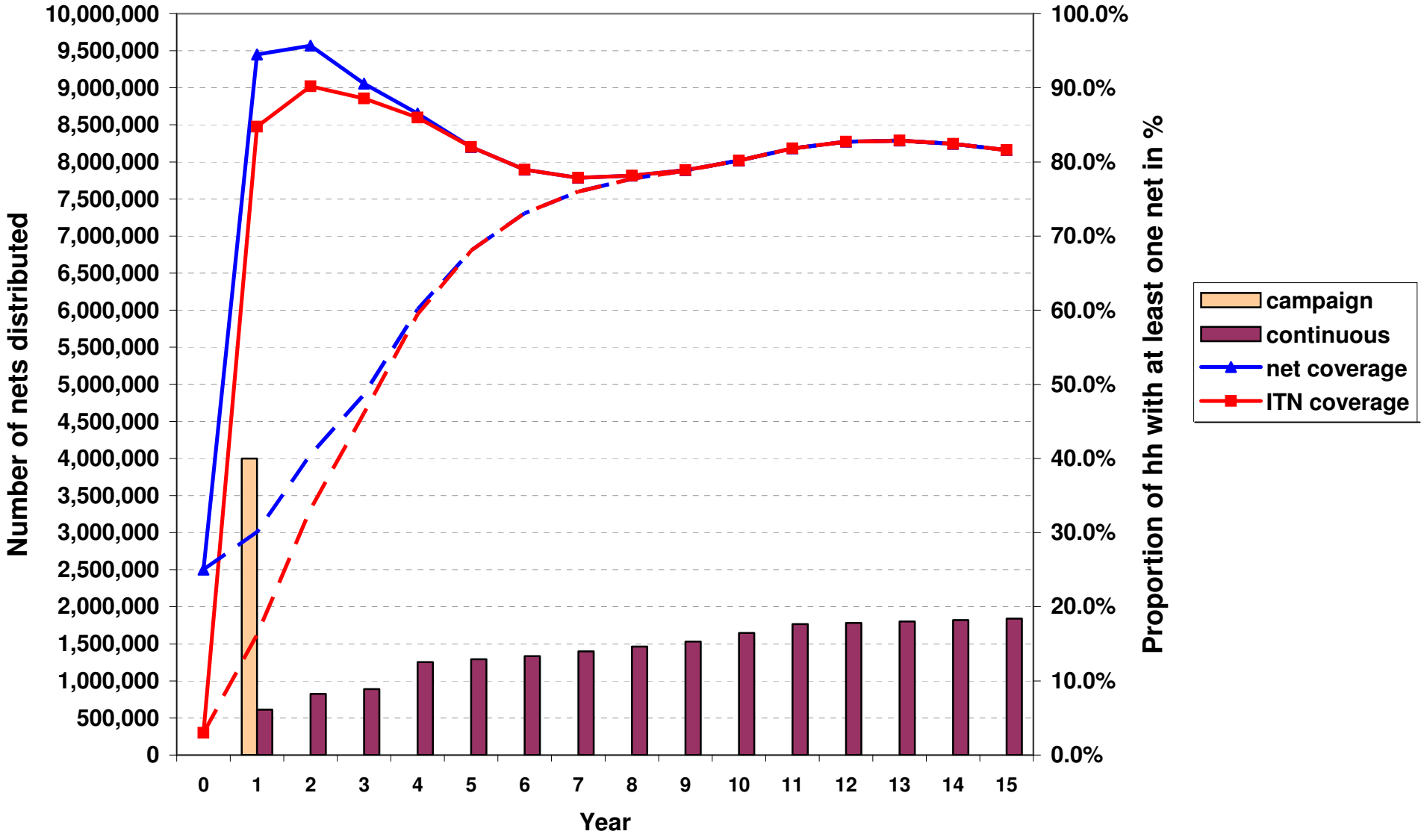


"3 year" LLIN

Population 10 million 25% nets, 3% ITN at start, 21.2 million LLIN distributed



"3 year" LLIN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Number of nets distributed
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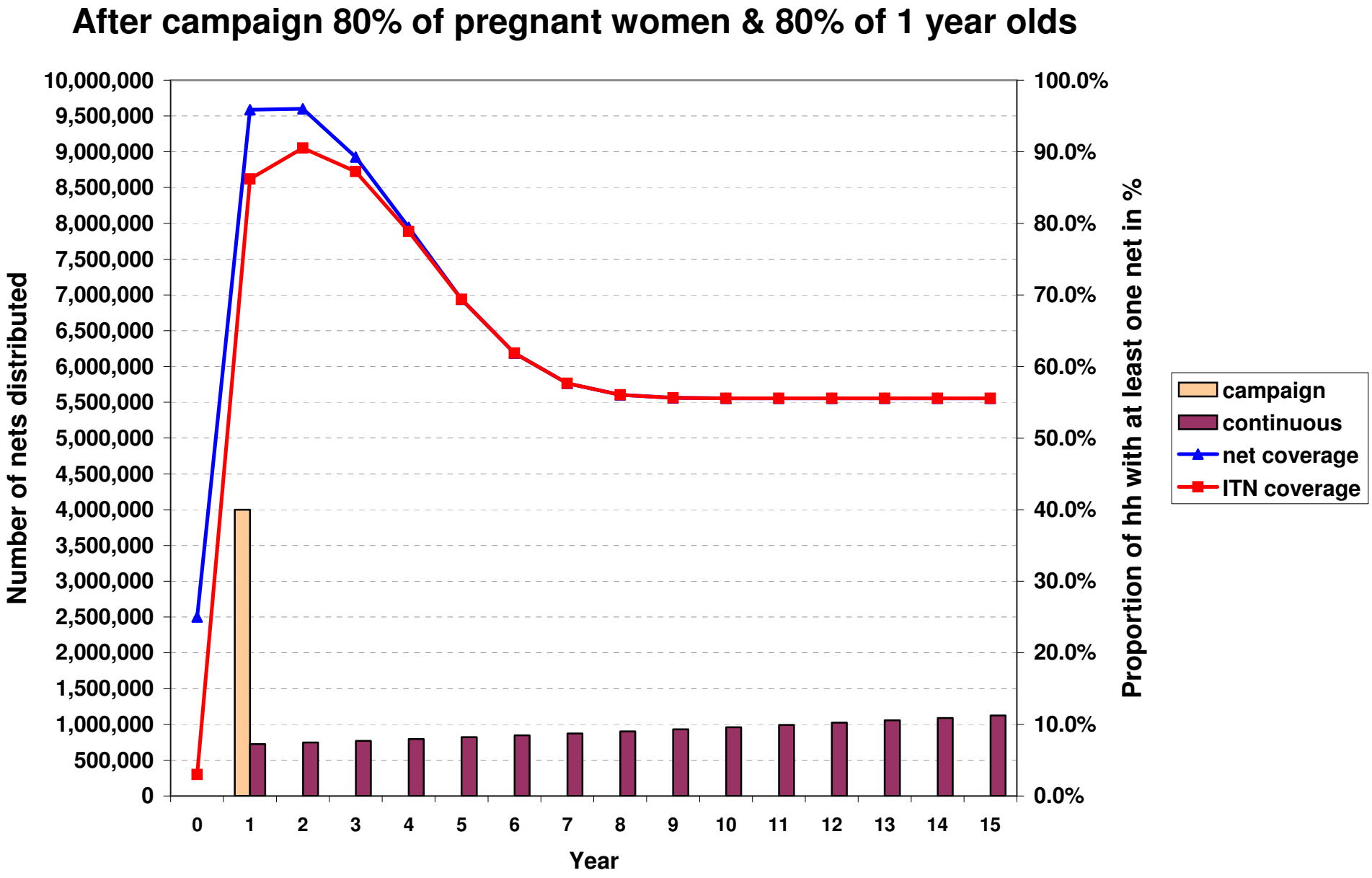
Proportion of hh with at least one net in %
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Year
campaign
continuous
net coverage
ITN coverage

"3 year" LLIN


After campaign 80% of pregnant women & 80% of 1 year olds
Number of nets distributed
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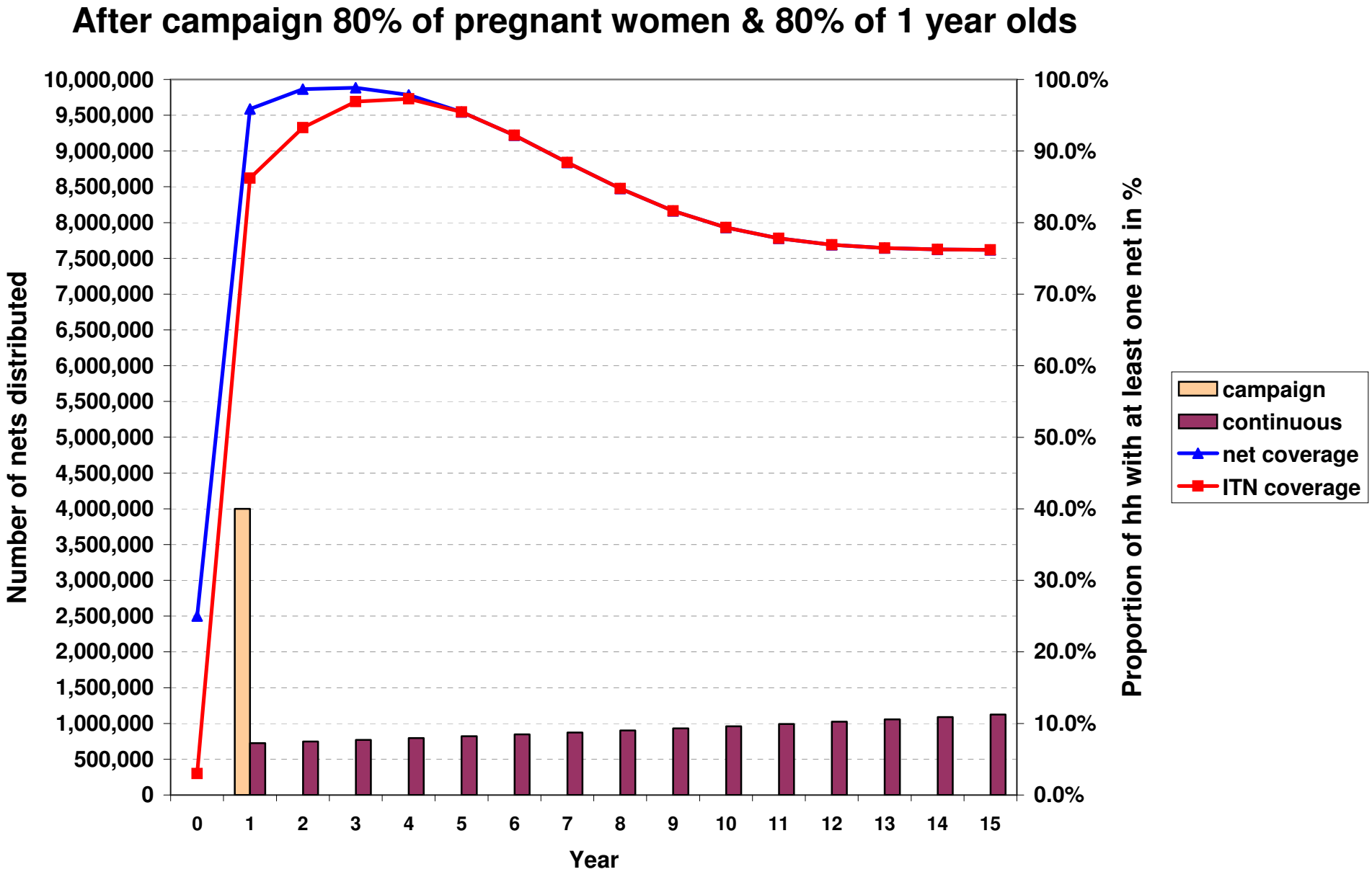
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Proportion of hh with at least one net in %
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Year
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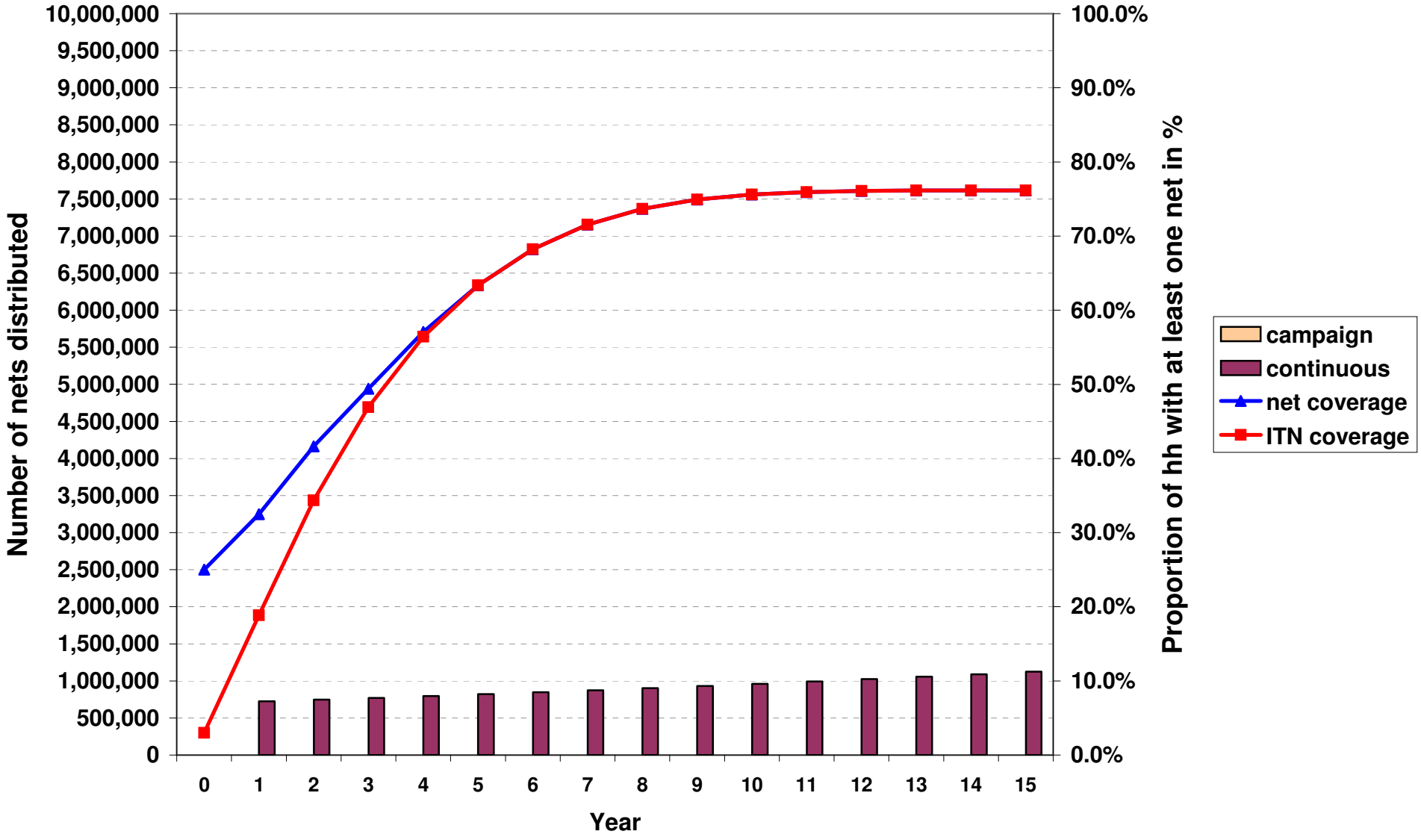
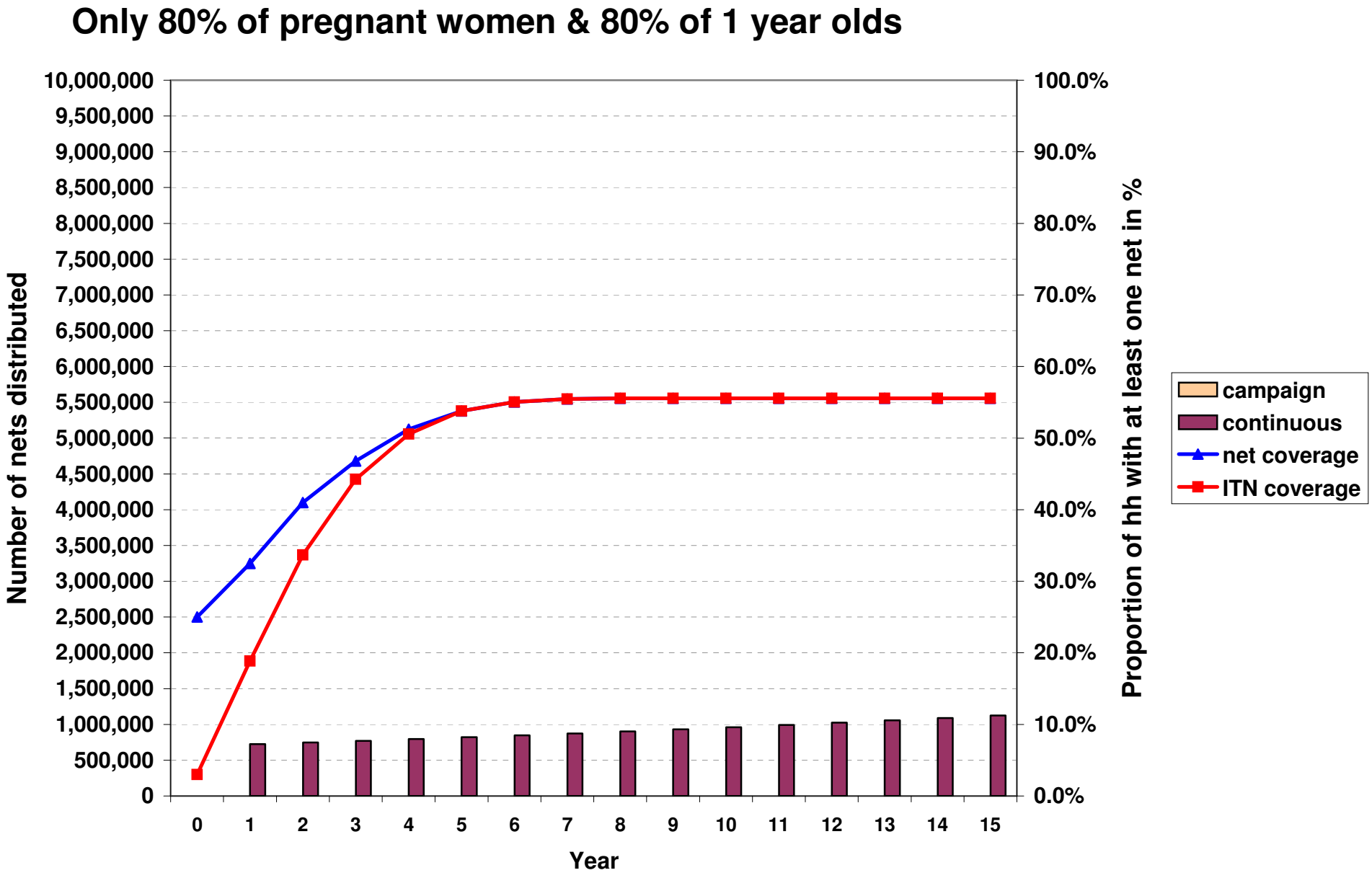
"5 year" LLIN

Only 80% of pregnant women & 80% of 1 year olds



"3 year" LLIN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