Newcastle Disease Vaccine Adoption Cluster Studies: India, Nepal & Uganda

A GALVmed Monitoring and Evaluation Study

GALVmed

Protecting Livestock – Improving Human Lives

Executive summary

Adoption rates are a fundamental measure of success for GALVmed. Our mission is to improve the productivity and livelihoods of smallholders through the use of key animal health products. The proportion of smallholders using these products (the adoption rate) is therefore both a key measure of success and an important determinant of impact.

GALVmed takes a market based approach, meaning that smallholders must be willing to pay the market price and that supply chain players (distributors, retailers, vaccinators) must see a financial incentive in supplying the product. The adoption rate is therefore a cumulative measure of numerous supply and demand factors which are best described in terms of the four A's of Adoption:

- **Awareness:** the smallholder needs to know about the product in question.
- **Access:** the smallholder needs to have physical proximity to buy the product.
- **Advantage:** the product needs to deliver sufficient value to the smallholder.
- **Affordability:** the price needs to be perceived to be right by the smallholder.

Prior to GALVmed's market development work there was very little data on smallholder adoption rates of animal health products. The early Newcastle Disease (ND) vaccine market development projects afforded an ideal opportunity to generate adoption level data. In particular, the projects used live strain vaccines, requiring smallholder flocks to be vaccinated every three to four months, and thereby offered the unusual opportunity of providing longitudinal adoption data. Generating this field data required the establishment of 'adoption clusters' in the field. This involved random selections of poultry owning households in a given area who were then subject to questionnaires at intervals corresponding to the required frequency of vaccination.

These adoption cluster studies would provide answers to two fundamental questions and which had previously caused considerable debate:

Question 1: What proportion of poultry owning smallholders would typically adopt the vaccine, 5%, 50%, 95%? **Answer:** the adoption cluster studies typically showed a surprisingly high level of ND vaccine adoption, often 80% or more. This was surprising given the high proportion of smallholders owning poultry but not necessarily specialising in it. Clearly, the severity of the disease and affordability of the vaccine (typically $0.03 per dose) make for a compelling case.

Question 2: Would the observed adoption rates change significantly over time? Would they increase gradually, would they decrease (dis-adoption) rapidly etc? **Answer:** the adoption cluster studies generally showed a relatively stable level of adoption. Where significant changes occurred, these were thought to arise from 'Access' issues (e.g. vaccinators not being present).

The generally high observed adoption rates from the studies demonstrate the real value of the ND vaccine. The underlying disease poses a major constraint on smallholder poultry production and the demand from smallholders is sufficiently strong to ensure an adequate supply of vaccine through the supply chain. Crucially, this includes bridging the 'last mile' in getting the vaccine to the smallholder customer. Experience in other GALVmed market development projects with other livestock vaccines show that high rates of adoption of livestock vaccines are by no means universal and can vary substantially depending on the disease and the product.

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Background

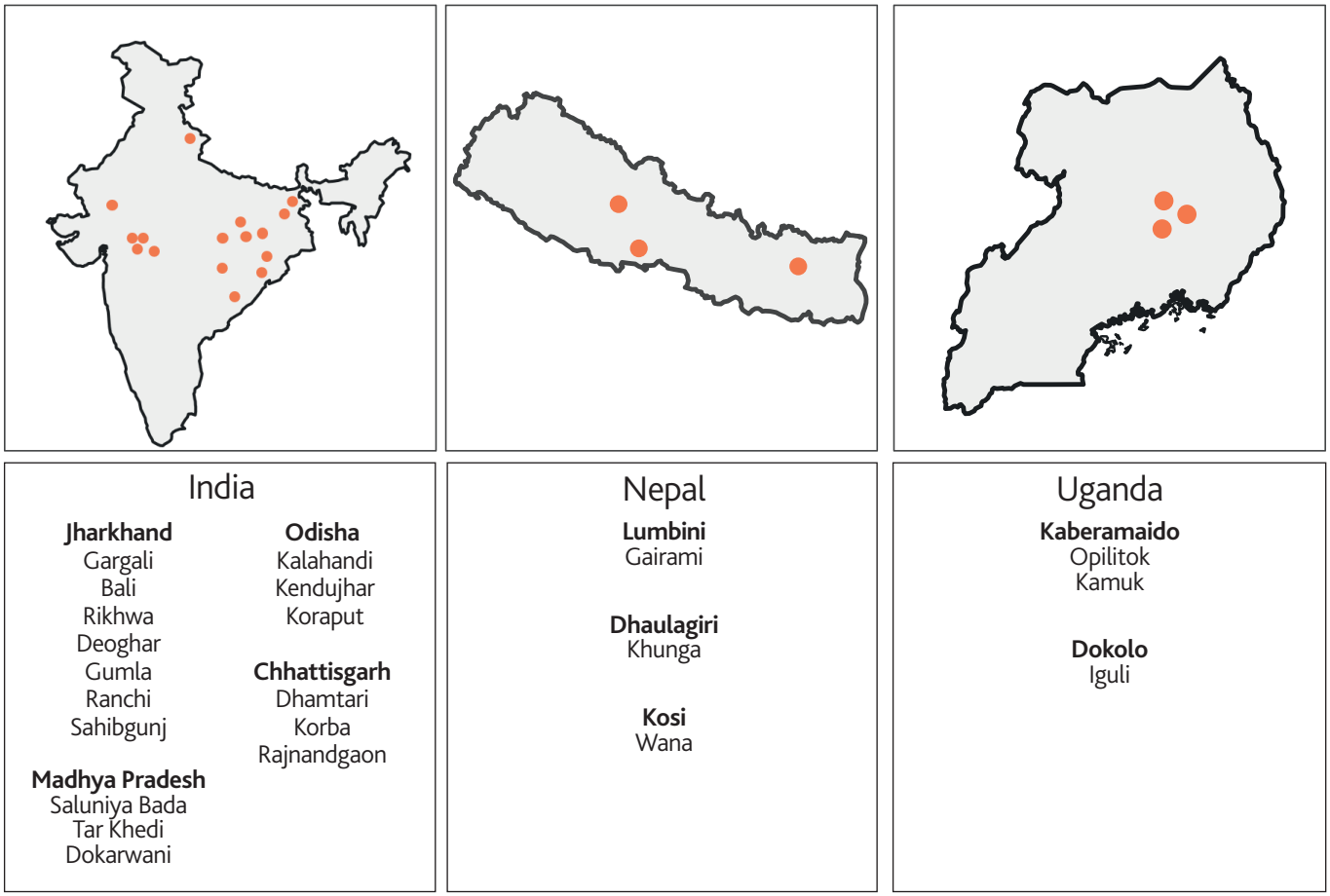
GALVmed's adoption cluster studies were set up to prospectively collect adoption data over three years with the view to determining changes in levels of adoption of Newcastle Disease (ND) vaccines and to potentially further explore drivers for adoption in India, Nepal and Uganda.

The collective aim of the studies was to understand how quickly ND vaccine adoption takes place, how long it takes to get to high levels of adoption, and whether smallholders are likely to maintain ND vaccine adoption over time or whether disadoption would occur.

The pathway to adoption was largely the same in all three countries. The ND vaccine was distributed from manufacturers to district- or local- level agro-veterinary dealers (agrovets), and then to community vaccinators. Community vaccinators administered the vaccine during community vaccination campaigns and individually to households.

Data was collected three times per year, in line with the vaccination campaign cycles, within the catchment areas of GALVmed's ND vaccine market development projects.

Figure 1. *Map of Adoption Clusters, India, Nepal and Uganda*



Study design

Questionnaire

Questionnaire-based surveys were used to collect data from households with repeat questioning (Appendix 1 – Baseline; Appendix 2 – Follow-up Questionnaire). Survey questions addressed the demographic data of the primary person responsible for tending poultry, flock size, use of ND vaccines, and sale or consumption of poultry birds. The questionnaire was written in English and translated into local languages. Each questionnaire took approximately 5 - 10 minutes to administer.

A baseline questionnaire was administered by trained vaccinators to selected households in each cluster. In addition to adoption data, the questionnaire collected demographic and poultry consumption information. This write up will focus purely on adoption.

The clusters were monitored closely over three years. During each vaccination campaign, vaccinators revisited the randomly selected cluster households and administered a follow-up questionnaire. The vaccinators were instructed to continue surveying the household if the household stopped purchasing and using ND vaccines. Households that migrated out of the project area were dropped from the sample.

The cluster studies were implemented by five implementing partners. In India, the partners included the Society for Upliftment of People with People's Organization and Rural Technology (SUPPORT), Sampark Samaj Sevi Sanstha (SAMPARK), and Hester Biosciences (Hester). In Nepal, the implementing partner was Helen Keller international (Helen Keller) and in Uganda, the implementing partner was 3V Vets.

The Hester Biosciences cluster in India was the only large scale commercial project of the five cluster studies. The other four studies were implemented by local NGOs (India), an international NGO (Nepal), and a private limited company (Uganda). The cluster studies were carried out over various locations and time periods, indicated in Table 1.

Table 1. *Cluster Study Locations and Time Frames*

Cluster Study	Country	State/ Zone/ District	Area	Start Date	End Date	Total Months
SUPPORT	India	Jharkhand	Gargali	November 2014	May 2017	30 months
			Bali			
			Rikwha			
Helen Keller	Nepal	Lumbini	Gairami	January 2015	July 2017	31 months
		Dhaulagiri	Khunga			
		Kosi	Wana			
SAMPARK	India	Madhya Pradesh	Saluniya Bada	June 2015	June 2017	24 months
			Tar Khedi			
			Dokarwani			
Hester	India	Chhattisgarh	Dhamtari	June 2015	June 2017	24 months
			Korba			
			Rajnandgaon			
		Odisha	Kalahandi			
			Kendujhar			
			Koraput			
		Jharkhand	Deoghar			
			Gumla			
			Ranchi			
			Sahibgunj			
3V Vets	Uganda	Kaberamaido	Opilitok	June 2015	June 2017	24 months
			Kamuk			
		Dokolo	Iguli			

Sampling

Households to be included in the clusters were identified using multistage sampling. The selection process broadly followed the same steps. First, the area of interest was divided into several sub-areas including districts, sub-regions, tribal/ethnic areas and/or villages. Clusters were selected from these sub-areas using a map of the region, household population numbers, household population distribution per village and estimated numbers of poultry per household. GALVmed provided technical support in the selection of households to reflect the population of interest. Approximately 50 households per area listed in Table 1 were selected.

Data processing and statistical analysis

Data was collected on paper forms by project partners, before being photocopied and sent to relevant GALVmed regional offices. Paper copies were then transcribed to electronic (Excel) format before being submitted to the GALVmed Monitoring and Evaluation (M&E) team for analysis. Outliers were removed on a single-metric basis (rather than declaring entire records void). Subsequent analysis was completed using a combination of Microsoft Excel & R statistical software.

Findings

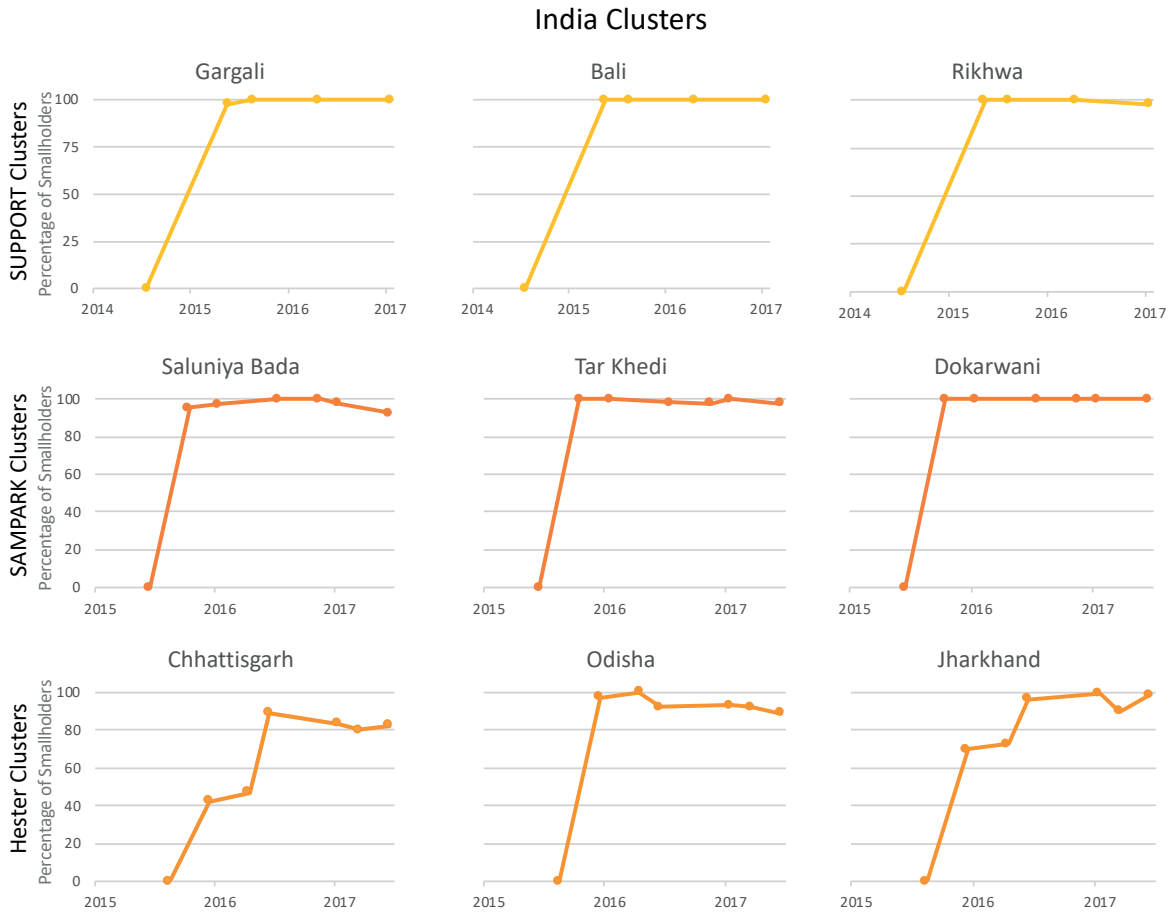
Using periodic surveys to monitor the level of adoption within the clusters, adoption rates varied across countries and cluster locations. Adoption was highest and most consistent in India (Figure 2), although the 100% adoption rates reported are likely a product of intensive sensitisation that can only be achieved through small, local, NGO-type field projects, and not the large scale, commercial type projects that GALVmed focuses on.

The commercial-led Hester clusters - in Chhattisgarh, Odisha, and Jharkhand states - demonstrate the variation that is more typical of commercial levels of marketing. In December 2015, four months after the start of the project, nearly all smallholders (97%) in Odisha had vaccinated their birds compared to 70% in Jharkhand and 42% in Chhattisgarh. These numbers continued to climb to above 80% from the end of the first year onwards.

In the local NGO-led clusters, almost all smallholders adopted the ND vaccine for all of their birds within the first year. The SUPPORT clusters – Gargali, Bali, and Rikhwa in Jharkhand state – maintained adoption rates above 98% for the duration of the studies. Similarly, in the SAMPARK clusters – Saluniya Bada, Tar Khedi, and Dokarwani in Madhya Pradesh state - nearly all smallholders (ranging from 92% to 100%) vaccinated their poultry.

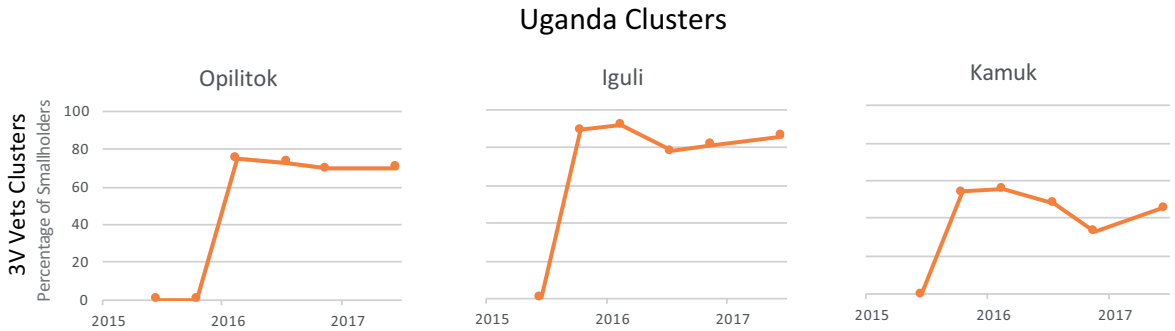
In the final year of each cluster, all locations in India reported vaccination rates above 80%. Disadoption did not occur in any of the Indian clusters; all locations attained high adoption levels within a year and maintained broadly the same rates of adoption throughout the studies.

Figure 2. *Smallholder Adoption of ND Vaccines Over Time (India Clusters)*



By contrast, in Uganda (Figure 3) the clusters - Opilitok, Iguli, and Kamuk in the Kaberamaido and Dokolo districts - reported lower overall vaccination rates than the Indian clusters. Adoption increased from 0% in all three locations to 56% in Kamuk, 75% in Opilitok, and 92% in Iguli within eight months of the baseline. These vaccination rates held relatively steady thereafter with some fluctuations between measurement points – notably in Kamuk and Iguli. Typically a strong link was observed between ND vaccine adoption and flock size i.e. as the flock sizes increased, so did the likelihood of an individual smallholder using the ND vaccine .

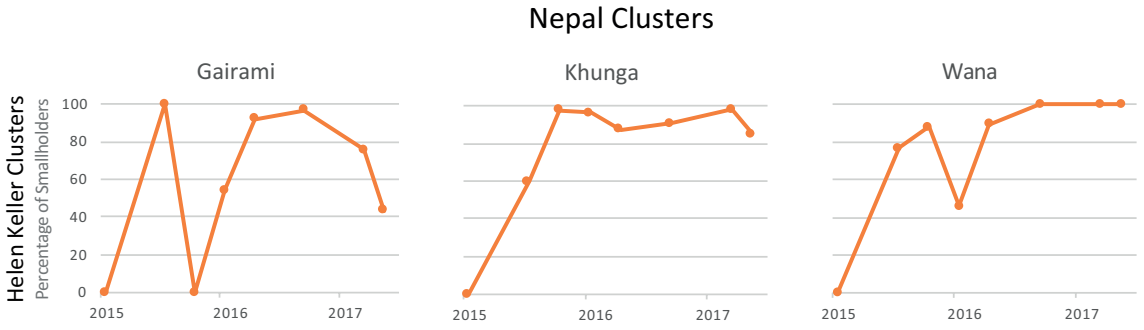
Figure 3. *Smallholder Adoption of ND Vaccines Over Time (Uganda Clusters)*



Adoption of ND vaccines in Nepal varied more widely than in India or Uganda. In the international NGO-led Helen Keller clusters, high adoption rates were achieved relatively quickly but the adoption rates fluctuated substantially over the course of the studies.

In Gairami (Lumbini zone of Nepal), the adoption rate increased from 0% to 100% within six months, reverted to 0% three months later, rose thereafter and then dipped to 43% of smallholders vaccinating their poultry by the end of the project. In Khunga (Dhaulagiri zone), adoption rates climbed steadily and stayed consistently above 85% towards the latter part of the project. Wana (Kosi zone) vaccination rates dipped to 46% at the January 2016 survey, but from April 2016 to May 2017 remained consistently high. The dip in adoption rates in Gairami and Wana may be due to lack of access to the vaccines (e.g. vaccinators not available). Nevertheless, adoption rates climbed thereafter.

Figure 4. *Smallholder Adoption of ND Vaccines Over Time (Nepal Clusters)*



Conclusions

The adoption cluster studies ranged in location (India, Nepal and Uganda), type of implementing partner (commercial partner, local/international NGO and private limited company), and length of operation (24 to 31 months). Despite these differences, the studies showed, for the most part, high levels of adoption of ND vaccines within a year and little disadoption.

In general, the consistently high observed rates of ND vaccine adoption can be best explained in terms of the four A's of Adoption:

- **Awareness:** the smallholder needs to know about the product in question. The severity of ND means that an effective product will attract significant interest from smallholders and supply chain players (who will market the product).
- **Access:** the smallholder needs to have physical proximity to buy the product. Poultry vaccinators who buy the vaccine from rural retailers and sell / administer the vaccine appear to be a crucial cog in the supply of the vaccine to the smallholder. When they are absent or inactive the adoption levels decrease significantly.
- **Advantage:** the product needs to deliver sufficient value to the smallholder. Smallholders are able to keep more birds without fear of an outbreak of ND destroying their flocks.
- **Affordability:** the price needs to be perceived to be right by the smallholder. At around $0.03 per dose, the vaccine is seen as providing a very good return on investment for the smallholder.

Overall, the picture is very encouraging for GALVmed's ongoing ND market development activities. The five cluster studies demonstrated that ND vaccination is able to penetrate quickly into communities and to persist broadly over time. ND vaccination does not seem to be a one-off fad but rather becomes a sustained practice once smallholders see the benefit.

Acknowledgements

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Appendix 1

Adoption Clusters Baseline Questionnaire

Date:	
Vaccinators name:	
Name of Project:	
Cluster Area ID:	

Respondent's Data

Surname of the person looking after the birds:		First Name of the person looking after the birds:		
District Village Sub-village Address		Telephone Number:		
Household Number ID				
Gender	▫ Male	▫ Female		
Age				
Education	▫ Illiterate	▫ Literate without formal schooling	▫ Primary School	▫ High school or above
Number of people who live in this household				
How many birds do you keep?				
Have you vaccinated your birds against ND in the last 3 months				
How many *birds* have you consumed/sold from your own flock in the last 3 month?				
Have you consumed/sold any *eggs* produced from your own flock in the last 3 month?	▫ Yes		▫ No	
Do you keep other livestock	▫ Yes		▫ No	

Appendix 2

Adoption Clusters Follow-up Questionnaire

Date:
Vaccinators name:
Name of Project:
Cluster Area ID:

Respondent's Data

Surname of the person looking after the birds:	**First Name of the person looking after the birds:**	
District **Village** **Sub-village** **Address**	**Telephone Number:**	
Household Number ID		
How many birds to you keep?		
How many birds were vaccinated		
How many *birds* have you consumed/sold from your own flock in the last 3 month?		

Cover photo credit: Sephi Bergerson/GALVmed.

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