

# Detection of Trans-boundary Animal Diseases by using Participatory Disease Surveillance (PDS) in Aga District, Dakahlia Governorate, Egypt

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## Abstract

Participatory Disease surveillance (PDS) has been used to produce more efficient and useful data in the prevention, treatment of diseases and improvement of veterinary services in the rural areas. PDS closes the gap between the veterinary public health disease investigators and the diverse livestock keepers. This study was conducted in 20 villages out of Aga district in order to detect the Trans-boundary Animal Diseases (TADs) present in the state. Various methods that were used in data collection were semi structured interview with key informants, simple ranking, proportional pilling, pairwise ranking, matrix scoring, seasonal calendar, mapping and transect walk. Highly pathogenic avian flu (H5N1) proved to be the most important disease of poultry found in the study area and is also a trans-boundary animal disease. The trans-boundary animal disease(s) of sheep and goat in this area is sheep pox and SAT2 FMD which happens to be the most important disease of sheep and goats in Aga district; in cattle and buffalo are SAT2 FMD and Lumpy skin disease (most important disease of cattle and buffalo in Aga district); in dogs is rabies. Challenges faced by the farmers include poor roads, animal diseases, high cost of feed and medication, poor veterinary services, far markets for sale of animal and animal products, predation of chicks by hawks and poor husbandry systems. There is a need to address the issue of trans-boundary animal diseases in Aga district in order to control the entry and spread of the disease in the area.

**Key words:** Trans-boundary animal disease; participatory Disease Surveillance (PDS); Egypt

## 1.0 Introduction

Trans-boundary Animal Diseases (TADs) are highly contagious diseases of livestock in the world moreover their economic importance is a major constraint in international trade. Their implication on human Health and National food security cannot be over emphasized. Zoonotic diseases among TAD's include diseases like West Nile Virus (WNV), Rift Valley Fever (RVF), Mad Cow disease (BSE), Bovine Tuberculosis, Rabies and Highly Pathogenic Avian Influenza (HPAI). Other important TADs are Foot and Mouth Disease (FMD), Contagious Bovine Pleuropneumonia (CBPP), Lumpy Skin Disease, Rabies, African Swine Fever (ASF) and Newcastle Disease (ND). Recently, a number of developed countries have been declared free from these diseases and they prevent introduction of the diseases to their countries by banning imports from infected developing countries. In Egypt the presence of TADs could be attributed to the unrestricted importation of animals from infected countries and poor veterinary services.

Participatory disease surveillance (PDS) is the use of participatory methods to collect epidemiologic data. Because of severe resource and logistic constraints in large areas of Africa, disease surveillance systems need to maximize the use of information provided by livestock keepers and make correct interpretations of indigenous livestock knowledge (Catley, 2006).

## 2. Materials and methods

### 2.1 PDS Team

The PDS team for this study was composed of three veterinarians.

### 2.2 Methodology

This study was carried out in 20 different villages in Aga district, Dakahlia Governorate, Egypt. The villages were selected for effective coverage of Aga District. Pre-advocacy visits were conducted to find a suitable meeting arena in each village according to the suitability of time, place, local politics and convenience of the farmers before the commencement of PDS. Both sex and different age group were included to avoid bias. Materials such as Geographical Positioning System (GPS, GARMIN's eTrex Legend personal navigator), cardboards, counters, permanent markers, digital camera and others were used for the study.

Each person was assigned a role before moving out. We always have our note taker, tool applicator and the facilitator.

In order to avoid bias, the Participatory Disease Surveillance (PDS) Team did not mention about TADs during the interview process. The following tools were used during the course of the participatory disease surveillance: (a) Check list consisting of the following items: mutual introduction, identification of respondents, sources of livestock, livestock species kept, husbandry systems, problems/challenges, livestock diseases, questions and advice, (b) Scoring and Ranking: simple ranking, proportional piling, pairwise ranking, matrix scoring and (c) Visualization which includes mapping, seasonal calendar and transect walk.

### 2.3 Data analysis

Data was analyzed as indicated in “A Manual for Participatory Disease Surveillance Practitioners: Introduction to participatory epidemiology and its application to highly pathogenic avian influenza participatory disease surveillance”.

## Results

Poultry is ranked as the most populous livestock specie in Aga District followed by cattle, buffalo, sheep and goat and dogs and cat (Table 1). Highly pathogenic avian flu (H5N1) is the most important poultry disease in Aga District followed by Newcastle Disease, low pathogenic avian flu (H9N2), Salmonellosis, Fowl pox, infectious bursal disease and Helminthosis (Table 2). Highly pathogenic avian flu and Newcastle Disease are TADs in poultry in Aga.

Lumpy skin disease is the most important disease in cattle and buffalo in Aga District, followed by Foot and mouth disease (SAT2) strain, Foot and mouth disease (O) strain, Facioliasis, Rumen impaction, lameness and External parasites (Table 3). Both FMD and Lumpy skin disease are TADs in Aga district in cattle and buffalo.

Sheep pox is the most prominent disease in sheep and goat in Aga district, followed by FMD SAT2, foot rot, contagious eczema, rumen impaction and Periorbital eczema. FMD SAT2 is the TAD observed in sheep and goat in Aga (Table 4). Rabies is the most prominent disease in dogs and cats in Aga district, followed by Helminthosis, Ectoparasitism, tumor and diarrhea. Rabies is the TAD observed in dog and cat in Aga district.

Ethno-veterinary practice in 20 village in Aga district where PDS was conducted are enumerated in Table 6.

**Table 1. Ranking of livestock species based on their population in Aga District**

Species /(population)	Ranking
Poultry/ (1 million)	1
Cattle/ (9000)	2
Buffalo/ (8880)	3
Sheep and goat/ (5764)	4
Dogs and cat /(2345)	5

**Table 2. Diseases of poultry, local names and ranking in Aga District**

Diseases	Local names in Aga District	Ranking
Newcastle Disease	Shouta	2
Highly pathogenic avian flu (H5N1)	Zaraak	1
Low pathogenic avian flu (H9N2)	Tashmah	3
Salmonellosis	Ishal	4
Fowl pox	Godary	5
Infectious bursal disease	-	6
Helminthosis	Didan	7

**Table 3. Diseases of cattle and buffalo, local names and ranking in Aga District.**

Disease	Local name in Aga District	Ranking
Lumpy skin disease	Okad	1
Foot and mouth disease (SAT2) strain	Reyalah	2
Foot and mouth disease (O) strain	El door	3
Facioliasis	Ghasshah	4
Rumen impaction	Lacmah	5
Lameness	Arag	6
External parasites	Korad	7

**Table 4. Diseases of sheep and goat, local names and ranking in Aga District.**

Diseases	Local name	Ranking
Sheep pox	Godary	1
Foot and mouth disease (SAT2)	Reyalah	2
Foot rot	Aphan	3
Contagious Eczema	Gelpha	4
Rumen impaction	Lacmah	5
Periorbital eczema	Ein zarkaa	6

**Table 5. Diseases of Dog and cat, local name and ranking in Aga District**

Diseases	Local name	Ranking
Rabies	Soaar	1
Helminthosis	Didan	2
Ectoparasitism (lice and tick infestation)	Korad	3
Tumor (TVT)	Saratan	4
Diarrhea	Ishal	5

**Table 6. Ethno-veterinary practice in 20 village in Aga district where PDS was conducted**

Species	Disease	Local treatment
Poultry	Newcastle disease	Basal roots
	Fowl pox	Phenol compounds + whey
	Highly pathogenic avian influenza	Corcomin
Buffalo and cattle	Foot and mouth disease	Orange juice + taheenah + alum
	Lumpy skin disease	Carbonato wash
	Facioliasis	Beryl
Sheep and goat	Sheep pox	Gentian violet
	Foot and mouth disease	Taheenah

**Constraints and challenges-** The problems faced by the farmers include poor roads (30%), animal diseases (50%) , high cost of feed and medication (70%), the high cost of day old chicks (60%), theft of livestock (10%), poor veterinary services (45%), far

markets for the sale of animal and animal products (20%), predation of chicks by hawks (5%), scarcity of animal feed during dry season (4%), husbandry systems (56%).

### **Discussion**

Among the livestock species kept in 20 villages where this study was conducted, poultry was found to be the most abundant livestock specie in Aga District. Poultry diseases have a great impact due to poor management. Highly pathogenic avian flu (H5N1) is the most prominent trans-boundary animal disease of poultry in this area. This could be attributed to the presence of abundant risk factors that enhance the spread of infection such as poor respond ability of governmental organizations in data collection about the disease, poor education level of householders and poor biosecurity (Abou El-Amaiem et al., 2013).

Lumpy skin disease is the most prominent transboundary animal disease in large ruminants while, sheep pox is the most prominent disease in sheep and goat in Aga district. Occurrence of such diseases in this area is attributed generally to poor quality and availability of veterinary services as is the case with many other developing countries (Abou El-Amaiem and Abd El-Kareem, 2013).

Poverty, poor education and privatization of veterinary services are challenges in the use of veterinary drug by farmers in these communities; hence there is an urgent need for government to make these services affordable for these people. Ethno-veterinary medicine is still in practice in almost all the villages. There is need to include a botanist in the PDS team in future for easy identification of some of the trees and plants which are being used for ethno-veterinary medicine due to the fact that these plants used by the rural dwellers are named in their local dialect.

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