



## Research Article

# HEALTH CARE AND STATUS OF FOOT AND MOUTH DISEASE (FMD) IN ANIMALS OF BANASKANTHA DISTRICT

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**Abstract-** A study entitled "Status of FMD vaccination in Banaskantha district of Gujarat" was undertaken during 2013-14. Two separate semi-structured interview schedules for farmers and veterinary Doctors were used. The data was collected from randomly selected 120 farmers spread over 12 villages in two Talukas and 20 Veterinary Doctors posted in the district. Farmers considered reduction in milk yield as important loss due to FMD. The coverage of animals through vaccination against FMD was very dismal. Moreover, goat and sheep were not included in vaccination. Majority (82.50%) of dairy farmers reported occurrence Foot and Mouth Disease (FMD) and cattle (74.16%) is most susceptible for FMD disease as compared to buffaloes. It might be due to the fact that 75.00 per cent of Doctor respondents considered losses due to mortality more important than morbidity. Majority (65.00%) of respondents revealed that incidence of disease once in a year. Nevertheless, 75.83 per cent respondents reported their animals were more susceptible to disease in rainy season. Higher number of respondents called to doctors for treatments of affected animals. Maximum (65.00%) dairy farmers were reporting disease to the nearest veterinary hospital and affected animals were treated by veterinary doctors.

**Keywords-** Dairy farmer, Veterinary doctor, FMD, Vaccination.

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## Introduction

Livestock is an important sub-sector of Indian agricultural economy and plays a multifaceted role in providing livelihood support to the rural population particularly for landless labours, small and marginal farmers. Livestock sector apart from contributing to national economy in general and to agricultural economy in particular also provide employment generation opportunities, asset creation, coping mechanism against crop failure and social and financial security. The growth in livestock sector has been faster than crop sector. This livestock sector contributes about 4.96 per cent [1] to the total GDP of India, in spite of the fact that livestock sector in India is seriously affected every year due to various diseases. Indian economy may further increased significantly from the livestock sector once it is able to harness full potential of livestock sector by improving health status of the animals and eradicating certain problematic diseases from India.

Disease in farm animals has a significant financial impact on animal production and incurs considerable costs for societies in both developed and developing countries [2]. According to some estimates, India suffers a loss of Rs 50 billion in annual production as a result of neglect of disease prevention and control. Economic loss due to disease occur in the form of direct loss the account of reduction in milk production, quality and quantity of meat, work capacity and growth and mortality. There are certain major diseases afflicting livestock that are serious and fast spreading in India. One of such diseases is Foot and Mouth Disease (FMD) According to an estimate in India, FMD alone causes loss of approximately Rs. 4000 crores per year [3] and it is Rs 18000 crores as per Govt. of India (GOI) estimates.

FMD is highly transferable disease and is endemic in India. It occurs almost in every part of the country, throughout the year. FMD has been listed in OIE (Office International des Epizooties) infectious diseases' list. Those countries are free from this disease impose trade embargo on export of animals and animal products on the countries, where FMD is improperly controlled [4]. Because of this trade block, India suffers heavy economic losses in terms of export potential apart from the production losses. India's potential for exporting animal products is increase significantly if India is declared free form FMD.

The present study has been framed to know status of Foot and Mouth Disease in dairy farmers of Banaskantha district of Gujarat.

## Materials and Methods

### Locale of the study

The present study was conducted in Banaskantha district of Gujarat. Banaskantha is 3<sup>rd</sup> largest district of the Gujarat and is located in the northern region of the state. Banaskantha is having quite good population of crossbred cows and a well developed dairy sector through co-operatives.

The total area of the district is 10,400.16 sq. kilometers from the district head quarter Palanpur. The geographical location of Banaskantha district is 71.03 to 73.02 degrees east longitude and 23.33 to 24.25 degrees north longitude.

### Selection of district

In North Gujarat Banaskantha, Sabarkantha, Mehsana and Patan are having significant number of dairy animals. Out of these four districts, Banaskantha is selected

purposely being highest milk producing district in the state as well as highest number of dairy animals. The Palanpur and Vadgam taluka of the district have large population of dairy animals & highest milk production, so they were also be selected purposively.

### Selection of taluka

The present study was conducted in the Palanpur, and Vadgam talukas of Banaskantha district of North Gujarat.

### Selection of villages

Total 12 villages were selected from the Palanpur and Vadgam talukas. Six villages from each taluka by random sampling technique.

### Selection of the respondents

A total of 120 farmers and 20 veterinary Doctors were considered as the sample volume of the study.

### Development of an interview schedule

The interview schedule was developed for farmers and veterinary Doctors separately. Keeping in view the objectives of the study, a structured interview schedule was prepared, while formulating questions for the schedule.

### Collection of data

Data was collected from farmers respondents through personal interview with the help of semi structured interview schedule developed for the study and analysis related to veterinary Doctors was based on responses of the 20 Doctors.

## Result and Discussion

### Disease Profile of the Animals in Recent Past (2013-14)

Disease of animals that occurred recently in both Talukas is profiled in [Table-1]. Among infectious disease, majority of respondents 80.00 per cent reported the incidence of FMD in Palanpur taluka and 85.00 per cent in Vadgam taluka. 70.00 per cent respondents in Palanpur taluka and 60.00 per cent respondents in Vadgam taluka reported the occurrence of mastitis in animals. Protozoan diseases like Theileriosis were reported by 43.33 per cent of respondents in Palanpur taluka and 30.00 per cent respondents in Vadgam taluka. Reproductive disorders (87.50 per cent) and parasitic infestation (62.50 per cent) were reported by majority of the respondents in both Talukas. Overall, 82.50 per cent respondents reported occurrence of FMD, only 26.67 per cent respondents reported HS and 65.00 per cent respondents reported mastitis. Overall in the area, 62.50 per cent respondents reported ecto and endo-parasitic disease including diarrhoea. Similarly Gokhle *et al.* (2002) [6] reported that diarrhoea was the most common disease symptoms followed by FMD as noticed by goat rearers.

**Table-1** Disease profile of the animals in recent past (2013-14)

Taluka Disease	Palanpur (n=60)	Vadgam (n=60)	Total (n=120)
H.S	18 (30.00%)	14 (23.33%)	32 (26.67%)
Mastitis	42 (70.00%)	36 (60.00%)	78 (65.00%)
FMD	48 (80.00%)	51 (85.00%)	99 (82.50%)
Reproductive disorders	51 (85.00%)	54 (90.00%)	105 (87.50%)
Theileriosis	26 (43.33%)	18 (30.00%)	44 (36.67%)
Parasitic disease	32 (53.33%)	43 (71.67%)	75 (62.50%)

### Species of Animals Affected By Diseases

Farmers under study were rearing the various types of animal species. The occurrence of disease depends on the resistance power of animal. So, frequency of disease occurrence is different in species to species.

**Table-2** Species of animals affected by diseases

Species Taluka	Cattle only n=60	Buffalo only n=60	Both cattle and buffalo N=120
Palanpur (n=60)	41 (68.33%)	12 (20%)	7 (11.67%)
Vadgam (n=60)	48 (80.00%)	7 (11.67%)	5 (8.33%)
Total (N=120)	89 (74.16%)	19 (15.83%)	12 (10.00%)

Result in [Table-2] shows that 68.33 per cent respondents reported that cattle (crossbreds) were affected from disease in Palanpur taluka. Similarly, in Vadgam taluka 80.00 per cent respondents reported that cattle were more affected from disease. Overall, 74.16 per cent respondents reported that cattle were affected from disease. The buffalo population is decline in Banaskantha district and crossbred cattle are more in number. This might be the reason that more incidence of disease was reported in cattle.

### Importance of Some Economically Important Disease Reported By Farmers and Veterinary Doctors

The importance of various diseases occur in animals is depend on the concept of farmers. Some farmers give more importance to the disease that cause mortality and others give morbidity more importance.

**Table-3** Importance of disease reported by farmers and veterinary doctor in both talukas of Banaskantha district.

Rank Disease	1FMD	2 Theileriosis	3 HS
<b>Farmers of Palanpur Taluka</b>			
Theileriosis (n=60)	26 (43.33%)	29 (48.33%)	5 (8.34%)
HS (n=60)	4 (6.67%)	18 (30.00%)	38 (63.33%)
FMD (n=60)	36 (60.00%)	24 (40.00%)	0
<b>Farmers of Vadgam Taluka</b>			
Theileriosis (n=60)	24 (40.00%)	34 (56.67%)	2 (3.33%)
HS (n=60)	2 (3.33%)	18 (30.00%)	40 (66.67%)
FMD (n=60)	33 (55.00%)	21 (35.00%)	6 (10.00%)
<b>Veterinary Doctors</b>			
HS	15 (75.00%)	5 (25.00%)	0
FMD	4 (20.00%)	13 (65.00%)	4 (20.00%)
Theileriosis	1 (5%)	2 (10.00%)	16 (80.00%)

Important disease viz. FMD, Theileriosis and HS have been ranked as first, second and third, respectively by farmers as per their perceived importance. The data is depicted in [Table-3]. It revealed that in Palanpur taluka 60.00 per cent respondents ranked FMD as first and 48.33 per cent respondents ranked Theileriosis as second and 63.33 per cent ranked HS as third important disease. Whereas, Vadgam taluka had 55.00 per cent of respondents ranked FMD as disease of first importance, Theileriosis as second and HS as third. Overall, 57.50 per cent respondents ranked FMD first rank and 52.50 per cent respondent ranked Theileriosis second rank. Overall only 5.00 per cent respondents ranked HS first rank (3). Whereas, veterinary Doctors ranked HS (75.00 per cent) as first importance and 65.00 percent of them ranked FMD second. Since HS causes more mortality among affected animals, Doctors might have considered it more importance.

It might be due to the fact that 75.00 per cent of Doctor respondents considered losses due to mortality more important than morbidity. In contrast, FMD causes more morbidity among affected animals and outbreak of disease partly affected economy of farmers, that is why it was ranked second by Doctors. Death of affected animals or their long term calculation of economic losses and more cattle population might be the possible reasons for ranking FMD in first place by 57.50 per cent farmers and 20.00 per cent Doctors.

### Incidence of Disease in A Year

[Table-4] shows no. of times a particular disease was noticed by the farmers respondents. It reveals that 60.00 per cent respondent reported incidence of disease once and 35.00 per cent of respondents reported about no disease in Palanpur taluka but in Vadgam taluka 70.00 per cent of respondents reported incidence of disease once in a year. Thus, incidence of disease is more in Vadgam taluka. This indicates that livestock health care is more pronounced in Palanpur taluka than in Vadgam taluka. Overall, 65.00 per cent respondents reported incidence of disease once, and only 5.83 per cent twice in a year.

### Seasonal distribution of the Diseases

The incidence of diseases mainly depends on the changes in environment and season. Seasonal changes highly influence to occurrence of the various disease

like cases of sick animals are more in rainy season then in winter and monsoon.

**Table-4 Incidence of disease in a year**

Incidence Taluka	Once	Twice	Thrice	Not reported
Palanpur (n=60)	36 (60.00%)	3 (5.00%)	0	21 (35.00%)
Vadgam (n=60)	42 (70.00%)	4 (6.67%)	0	14 (23.33%)
Total (N=120)	78 (65.00%)	7 (5.83%)	0	35 (29.17%)

**Table-5 Season wise incidence of diseases**

Seasons Taluka	Rainy	Winter	Summer
Palanpur (n=60)	48 (80.00%)	3 (5.00%)	9 (15.00%)
Vadgam (n=60)	43 (71.67%)	0	17 (28.33%)
Total (N=120)	91 (75.83%)	3 (2.5%)	26 (21.67%)

The incidence of diseases was categorized season wise into three seasons viz. rainy, winter and summer as presented in [Table-5]. It revealed that most of the animals were susceptible to disease in rainy seasons as it was reported by 80.00 per cent of respondents in Palanpur taluka and 71.67 per cent of respondents in Vadgam taluka. In pooled sample, 75.83 per cent respondents reported their animals were more susceptible to disease in rainy season.

### Extent of Spread of Disease After an Outbreak

Extent of spread of disease after an outbreak is presented in [Table-6]. 58.33 per cent respondents in Palanpur taluka and 55 per cent in Vadgam taluka reported that more than one animals were affected after an outbreak. This indicates that the diseases were of contagious or infectious nature.

They also reported that there were some diseases that afflicted only one animal (23.33 per cent in Palanpur taluka and 28.33 per cent in Vadgam taluka). Overall, 56.67 per cent respondents reported that Palanpur taluka more than one animals were affected from disease after an outbreak.

**Table-6 Extent of spread of disease after an outbreak**

Extent Taluka	Only one	More than one animals in a herd	More than one herd	Whole village	No spread
Palanpur (n=60)	14 (23.33%)	35 (58.33%)	2 (3.33%)	0	9 (15.00%)
Vadgam (n=60)	17 (28.33%)	33 (55.00%)	4 (6.67%)	0	6 (10.00%)
Total (N=120)	31 (25.83%)	68 (56.67%)	6 (5.00%)	0	15 (12.50%)

### Preventive Measures to Control the Spread of Disease

Perusal of data in [Table-7] indicates that 30.00 per cent of respondents in Palanpur taluka were practicing isolation of animals as preventive measures, 36.67 per cent respondents called Doctors for treatment. There are 13.33 per cent respondents in pooled sample practiced no measures to check spread of disease.

**Table-7 Preventive measures to control spread of disease**

Measures Taluka	Isolation of sick animals	Treatment by veterinarian	Both isolation of animals and Treatment by veterinarian	No measures
Palanpur (n=60)	18 (30.00%)	22 (36.67%)	14 (23.33%)	6 (10.00%)
Vadgam (n=60)	14 (23.33%)	25 (41.67%)	11 (18.33%)	10 (16.67%)
Total (N=120)	32 (26.67%)	47 (39.17%)	25 (20.83%)	16 (13.33%)

41.67 per cent of respondents in Vadgam taluka called Doctors for treatment of affected animals to check spread of disease and 23.33 percent of them used isolation of sick animals. Isolation of sick animals is strongly recommended to control the spread of contagious disease like FMD. But in the study area, only 26.67 per cent respondents practiced isolation of diseased animals. This might be due to their ignorance about such management practices. Das [7] reported that there were 20.22 per cent of dairy farmers who were not taking any measures against diseases.

### Perception of Importance of Losses Due to Disease

Losses due to disease in general were categorized into two types viz. losses due to morbidity and losses due to mortality [Table-8]. 80.00 per cent respondents in Palanpur taluka and 76.67 per cent respondents in Vadgam taluka considered mortality as more important loss.

**Table-8 Perception of importance of losses due to disease**

Losses Taluka	Morbidity	Mortality	Both
Palanpur (n=60)	3 (5.00%)	48 (80.00%)	9 (15.00%)
Vadgam (n=60)	0	46 (76.67%)	14 (23.33%)
Total (N=120)	3 (2.50%)	94 (78.33%)	23 (19.17%)

When they were further inquired further about the measures to minimize losses [Table-9], 63.33 per cent respondents in Vadgam taluka and 55.00 per cent in Palanpur taluka reported that they went for immediate treatment of diseased animals. But some (%) of the respondents across the blocks reported that they didn't perform anything actively to minimize losses and left this matter unattended.

**Table-9 Measures to minimize losses due to diseases**

Measures Taluka	Immediate treatment	Vaccination against disease	Both treatment and vaccination	None
Palanpur (n=60)	33 (55.00%)	11 (18.33%)	16 (26.67%)	0
Vadgam (n=60)	38 (63.33%)	9 (15.00%)	9 (15.00%)	4 (6.67%)
Total (n=120)	72 (60.00%)	20 (16.67%)	25 (20.83%)	4 (3.33%)

Only 16.67 per cent respondents reported that they adopted vaccination against certain disease like HS, FMD etc. When the Govt. and co. op. personnel come for vaccination then only well aware progressive farmers got their animals vaccinated. Gokhle *et al.* (2002) [6] reported that only 39.90 per cent studied goat rearers vaccinated their goats for various diseases like FMD, HS, BQ, Pox and enterotoxaemia [6]. Only 2.50 per cent of respondents considered losses due to morbidity as important as important loss in Palanpur taluka, while none of the respondents considered morbidity as a cause of loss in Vadgam taluka. This could be the reason that respondents paid less attention to disease that cause more morbidity than mortality.

### Reporting of Diseases

[Table-10] indicates reporting of disease by farmers to the nearest veterinary hospital. Reporting of disease at hospital is most important factor for the containment the infectious diseases in healthy herd or animals. 70.00 per cent of respondents reported about disease outbreak in Palanpur taluka and 60.00 per cent of respondents reported about disease in Vadgam taluka. More disease reporting tendency in Palanpur taluka could be attributed to more literacy [8] in Palanpur taluka than in Vadgam taluka, nearness to hospital/dispensary and proper response from Doctors in this Taluka. Overall, 65.00 per cent respondents said that they reported to the nearest veterinary hospital when their animals fell sick.

**Table-10 Reporting of disease to the nearest veterinary hospital**

Response Taluka	Yes	No
Palanpur (n=60)	42 (70.00%)	18 (30.00%)
Vadgam (n=60)	36 (60.00%)	24 (40.00%)
Total (N=120)	78 (65.00%)	42 (35.00%)

### Reporting of disease in hospital as reported by Doctors

[Table-11] indicates that reporting of disease in hospital as reported by Doctors. It shows that in 60.00 per cent cases farmers reported about the nearest veterinary Doctors. Half of them (50.00 per cent) stated that farmer reported to hospital when more than one animal were affected. Veterinary Doctors further reported that in case of sickness in crossbreds, they were more attentive to consult Doctor and were willing to pay for treatment, because crossbreds are costly and sensitive animals. Dwivedi [5] also reported that 50.00 per cent of

farmers invariably consulted the field veterinarian in case of sickness of crossbred cattle and also they did not hesitate to spend money on treatment. It may be concluded that in commercial farming were high yielding animals including crossbreds are generally maintained, the farmers would pay better attention on animal health care including prompt reporting of disease to the hospital.

**Table-11 Reporting of disease in hospital as reported by Doctors**

Reporting of disease in hospital as reported by Doctors (n=20)	
Yes	12 (60.00%)
No	8 (40.00%)
Time of reporting to hospital	
When one animal in herd is affected	2 (16.67%)
When more than one animals in herd affected	6 (50.00%)
When animals in more than one herd are affected	4 (33.33%)
When whole village is affected	0

### Response of Hospital Personnel

The response of hospital personnel was categorized into three categories viz. attending the case by Doctor, by hospital attendant and no response at all. The data shown in [Table-12] revealed that 80.56 per cent complaints were attended by Doctors in Vadgam taluka. 13.89 per cent of respondents reported that nobody responded to their complaints on time in Vadgam taluka. But in Palanpur taluka 90.48 per cent of respondents received feedback in term of

attending the cases by Doctors and none of them reported about case attended by hospital attendant. More response of Doctors in Palanpur taluka may be due to interest of Doctors and their availability in time of need. Overall, 85.90 per cent of respondents reported that Doctor came for treatment, whereas, only 2.56 per cent respondents reported that hospital attendant came for treatment of diseased animals.

**Table-12 Response of hospital personnel to the affected animals**

Response Taluka	By Doctor	By hospital attendant	No response on time
Palanpur (n=42)	38 (90.48%)	0	4 (9.52%)
Vadgam (n=36)	29 (80.56%)	2 (5.55%)	5 (13.89%)
Total (N=78)	67 (85.90%)	2 (2.56%)	9 (11.54%)

### Reasons for Not Reporting To the Nearest Veterinary Hospital

Respondents were asked to rank the reasons for not reporting the outbreak of disease to the nearest veterinary hospital. The data so obtained had been presented in [Table-13]. This revealed that 61.11 per cent of respondents ranked no free visit by the hospitals as rank first in Palanpur taluka. They are least bothered about unsatisfactory treatment as only 11.11 per cent of respondents ranked it first.

**Table-13 Reasons for not reporting to the nearest veterinary hospital**

Reason Rank	Remote location of hospital	No free home visit	Non-availability of Doctor	Unsatisfactory treatment	Lack of interest of Doctor
Palanpur Taluka (n=18)					
1	3 (16.67%)	11 (61.11%)	2 (11.11%)	2 (11.11%)	0
2	2 (11.11%)	6 (33.33%)	10 (55.55%)	0	0
3	0	1 (5.55%)	4 (22.22%)	10 (55.55%)	3 (16.67%)
4	1 (5.55%)	0	2 (11.11%)	6 (33.33%)	9 (50.00%)
5	12 (66.67%)	0	0	0	6 (33.33%)
Vadgam Taluka (n=24)					
1	4 (16.67%)	14 (58.33%)	4 (16.67%)	2 (8.33%)	0
2	6 (25.00%)	8 (33.33%)	8 (33.33%)	0	2 (8.33%)
3	0	2 (8.33%)	3 (12.50%)	7 (29.17%)	12 (50.00%)
4	8 (33.33%)	0	9 (37.50%)	5 (20.83%)	2 (8.33%)
5	6 (25.00%)	0	0	10 (41.67%)	8 (16.67%)

Similarly, in Vadgam taluka, 58.33 per cent respondents reported no free visit by the hospitals as rank first. Ranking of no free visit was found significant at 5% level of significance. It is clear that most of the respondents in both the talukas expected free home visit for their animals' treatment. This might be due to poor financial condition as well as the mindset i.e. expecting services freely, which, however, is gradually decreasing. Thus, farmers have to adjust to the changing economic scenario where services including animal health services are likely to be provided on user pays basis.

### Treatment of Sick Animals and Personnel Involved in Treatment

Response to the question whether they go for treatment of sick animals immediately or not, were sought from respondents [Table-14]. 90 per cent of the respondents in Palanpur taluka and 78.33 per cent of respondents in Vadgam taluka reported that Doctor visits farm for treatment of sick animals. Overall, 84.17 per cent respondents reported that veterinary Doctor visits the farm for treatment of sick animals. Thus, it appeared to be a favourable situation where farmer in big majority were responsive toward veterinary services provided by the veterinary hospital.

**Table-14 Treatment of sick animals by hospital**

Response Taluka	Yes	No
Palanpur (n=60)	54 (90.00%)	6 (10.00%)
Vadgam (n=60)	47 (78.33%)	13 (21.67%)
Total (N=120)	101 (84.17%)	19 (15.83%)

Personnel involved in treatment of sick animals were categorized into three

categories: Self/Desi medicine, quack and Doctors. The findings are represented in [Table-15]. It indicates that 7.41 per cent of respondents in Palanpur taluka resorted to desi/self medicines for treatment of animals. In Vadgam taluka, more quacks (29.79 per cent) were involved in treatment than in Palanpur taluka (22.22 per cent). Whereas, 63.83 per cent respondents consulted Doctor in Vadgam taluka and 70.37 per cent in Palanpur taluka.

**Table-15 Personnel involved in treatment**

Reasons Taluka	Self/Desi medicines	Quacks	Doctors
Palanpur (n=54)	4 (7.41%)	12 (22.22%)	38 (70.37%)
Vadgam (n=47)	3 (6.38%)	14 (29.79%)	30 (63.83%)
Total (n=101)	7 (6.93%)	26 (25.74%)	68 (67.33%)

Probable reason for treating animals by quacks (29.79 per cent) in Vadgam taluka might be the more illiteracy than in Palanpur taluka. Overall, in case of 25.74 per cent respondents, quacks treated the animals. 67.33 per cent respondents reported that Doctor treated their animals. This might be due to good response of Doctors when they were informed about disease. Dwivedi [5] reported that 71.00 per cent of respondents applied indigenous method of treatment at village level only, while 29.00 per cent respondents informed the veterinary Doctors who treated the animals.

### Reason for No Treatment of Sick Animals

The respondents were further probed for the reasons for not getting sick animals treated. It was observed that majority of respondents 84.22 per cent across the blocks cited poor financial condition as reason for not consulting to Doctors



[Table-16]. Poor financial condition and non-availability of Doctor were the reasons for 15.38 per cent of respondents in Vadgam taluka. Poor financial condition of respondents might be the big hurdle in disease prevention and control as in spite of their desire to get their animals treated they remained handicapped and left the animals untreated. This situation might adversely affect the cost recovery provision in animal health services that is being emphasized over the current almost free treatment.

**Table-16** Reasons for no treatment of sick animals

Reasons Taluka	Poor financial condition	Non-availability of Doctor	Both
Palanpur (n=6)	6 (100.00%)	0	0
Vadgam (n=13)	10 (76.93%)	1 (7.69%)	2 (15.38%)
Total (n=19)	16 (84.22%)	1 (5.26%)	2 (10.52%)

### Conclusion

Cows were more susceptible for FMD disease than buffalo. The diseases become more horrendous in rainy season. We also got an eye opening fact that the coverage of animals through vaccination against FMD was very dismal.

**Conflict of Interest: None declared**

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