NATIONAL VETERINARY HOSPITAL

ANNUAL PROGRESS REPORT 2019-20

DEDICATED TO HIS MAJESTY'S 40TH BIRTH ANNIVERSARY

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1. FOREWORD

I am pleased, as always, to bring forth the annual progress report of the National Veterinary Hospital (NVH) for 2019-20. The year 2019-20 has been a difficult year due to the COVID19 pandemic. The pandemic has however, not deterred our spirits and determination to provide the best of services to the public. Despite the limitations and inconveniences enforced by the pandemic, we are contented with our achievements, especially with regards to our principal activities. The over-par achievements of this hospital, year in, year out reflect the sheer passion and dedication of its staff towards their professional duties and to the TSA-WA-SUM.

Over the years, NVH has grown from strength to strength and continues to grow so, which is reflected in its distinctive functions and proficient services. I am delighted and well-pleased to be a part of this institution with a team of dynamic and diligent professionals.

Most of the target activities have been achieved except for the visit to a Highland area and monitoring of Pharmacovigilance activities in the fields due to the travel restrictions put forth as an aftermath of COVID19 pandemic. The Bhutan animal welfare standards and guidelines has been finally endorsed by the GNHC and shall be circulated for implementation in the next fiscal year. We are especially delighted to have acquired the budget support from RGoB to procure advanced diagnostic imaging equipment like X-ray, Doppler Ultrasound, Video-endoscope and Gaseous anesthetic machines. NVH also procured some equipment for microbiology with the budgetary support from RDCCRP. With the operationalization of these equipment, we will be able to provide efficient diagnostic services, enabling our veterinary clinicians in making early and accurate diagnosis which will ultimately improve the success rates of treatments saving time and cost.

All in all, the clinical activities target set out for 2019-20 have been successfully achieved (which are described in further details in this report). Therefore, I would like to dedicate the successes to all the colleagues in the department of livestock for the constant support and encouragement. I would also like to thank all the staff of NVH for their unwavering dedication as well as congratulate them on their achievements.

On a personal level, I feel fortunate to be able to continue my services and re-dedicate my services to the triple gem. I will always remain grateful to Their Majesties for their recognition and generous extension of my services. I am determined to contribute as much as I can. It's been a fruitful year and I pray and offer by best wishes to everyone for a fruitful 2020-2021 as well.

Thank you and Tashi Delek!

(Dr. Kinley Dorji)
Specialist Head

2. EXECUTIVE SUMMARY

We take pride in what we have been able to achieve and we look forward to overcome any challenges to achieve what has not been achieved as yet. 2019-20 has ended amidst the uncertainties and constraints that came along because of the COVID19 pandemic. The planned activities were carried out as per the targets and timelines set in the APA. However, a few of the activities, especially those which required gathering and travel had to be suspended. Out of the three target visits for mobile veterinary clinic in highland area, the remaining one was suspended due to the COVID19. Two highland visits to Soe, Thimphu and Laya, Gasa were made.
Two batches of SOP training on clinical veterinary services were conducted in collaboration with RLDC, Tshimasham and Dzongkhag Livestock Sector, Thimphu. The proposed training for Eastern region was suspended. The pharmacovilance monitoring activity was also suspended as it involved travelling.

It's a source of great delight to know that the primary activities of providing veterinary clinical services such as vaccination, pet registration, consultation, treatment, surgery including sterilization are invariably achieved year in and year out. A total of *20684* cases were attended out of which *14279* were attended during regular hours and *5406* during off hours. As the referral center for veterinary clinical services, NVH had formally recorded nine referral cases which were routed following formal SOP protocol. There were several informal referrals but are not recorded as referrals. Out of the *20684* cases, *1258* were of surgical nature. The highest surgical case comprised of general wounds *(819)* followed by dog bite wounds *(330)*. The bone pinning surgeries are picking up at NVH and this year, nine bone pinning surgeries were conducted which is double than the previous years. Dental scaling service as a part of pet's oral health care was also provided to four dogs with dental plaque and gum disease.

This year, NVH sterilized *773* animals, especially dogs and cats. Four Royal stallions and five bulls were also sterilized. The overall proportion of castration was almost one fourth (29%) compared to ovariohysterectomy which was nearly three fourth (71%) of the total sterilized. As an alternative to surgical method of sterilization, 59 dogs and cats were treated with oral and injectable Medroxyprogesterone.

A total of *2428* pet dogs were vaccinated with DHPPi + L vaccines. 2594 pets were vaccinated with anti-Rabies vaccine of which *2128* were dogs and *405* were cats. There has been an increase in pet registration number this year. A total of 1630 pets were registered, out of which *1197* were dogs and *433* were cats. The proportion of pet registration for dogs to cats is almost 3:1. Out of the total registered pets, *22* were for Royal pets while *1608* were for public. The highest number of breed registered was local dogs (*294*). A sum of Nu. *1,55,800/-* was collected as pet registration fees, which is deposited as revenue to the government.

At the moment, NVH is able to provide only Ultrasonography services. In 2019-20, *180* ultrasonography services were provided to the pets. Out of that, *97* were for pregnancy diagnosis and *83* were for exploratory or general exam purposes. Diagnostic services will be enhanced as we have been able to procure advanced diagnostic imaging equipment like X-ray, Doppler Ultrasound, Video Endoscope and Gaseous anesthetics. We have also managed to procure some laboratory equipment to revamp our existing laboratory unit to add a microbiology laboratory from the budgetary support from RDCCRP. With the operationalization of these equipment, our diagnostic capacities will be further enhanced, enabling us to provide correct treatment regimens. The laboratory section is divided into Hematology, Parasitology and Biochemistry. A total of 1697 samples were collected and 2,306 tests were performed in 2019-20. NVH had also referred 134 samples to NCAH. The referrals were for fungal/ bacterial culture, AST, histopathology and post mortem examinations.

NVH sees a lot of cases and therefore consume a good amount of medicines and consumables. During 2019-20 a total of 107 different medicines amounting to Nu. *6,13,140.31* were received. With the medicine utilization percentage of *84.82%*, the expiry rate was calculated at only 1.34%. Only four medicines were expired due to limited use, which translated to about Nu. 8262.5/-.

The budget utilization percentage was *97.60%* which is an improvement from the previous year with 95.13 %. A total of Nu. *28.702m* was approved for NVH during 201-209 fiscal year. Nu. *28.011m* was used and the balance amount was *Nu.0.691m*.
For 2019-20, the CRS for NVH was calculated at *86.4%* which is higher than the previous year (84%). The highest rating this year was for *Q1 (Staff friendliness)* compared to previous year which had *Q3 (facilities)*. Lowest rating was for *Q5 (waiting time)* for both the years. The longer waiting time could be attributed to increasing number of cases each year coupled with inadequate staff to provide prompt services.

In the unplanned/ adhoc activities, several meetings were attended by NVH staff, either as a resource person or participants. Extra country tour/ training was limited to only two visits which were both external funding (OIE and Fleming Fund Project).
NVH receives interns every year which comprise of CNR graduates mostly. This year, 20 interns who were a mix of diploma and graduate students interned at NVH for a period varying from few weeks to two months.
To enhance the research capacity of the hospital and its staff, NVH compile interesting case studies. The case studies of interesting and challenging cases are included in the report which will also serve as information and reference to our field colleagues.

3. Table of Contents

VETERINARIAN'S OATH!

Being admitted to the profession of veterinary medicine,
I solemnly swear
to use my scientific knowledge and skills
for the benefit of society
through the protection of animal health and welfare,
the prevention and relief of animal suffering,
the conservation of animal resources,
the promotion of public health,
and the advancement of medical knowledge.

I will practice my profession conscientiously,
with dignity,
and in keeping with the principles of veterinary medical ethics.

I accept as a lifelong obligation
the continual improvement
of my professional knowledge and competence.

“Personally, I have always felt that the best doctor in the world is the Veterinarian. He can’t ask his patients what is the matter…….he’s just got to know”.

-Will Rogers

4. BACKGROUND

Animal health is one of the important support services under the Department of Livestock. Animal health services include clinical veterinary services, supply of veterinary medicines, vaccines, equipment, and diagnostic services. The veterinary clinical services are being provided through a network of animal health facilities such as the National Veterinary Hospital (NVH), Thromde Veterinary Hospitals (TVH), four Regional Livestock Development Centres (RLDC), 20 Dzongkhag Veterinary Hospitals (DVH) and 196 Livestock extension centres (LEC/RNR-EC).

Since the first establishment of animal health services in the early 1960s, we have come a long way, and made tremendous progress, both in terms of infrastructure and human resource capacities. Over the years, the sole focus on treatment of animals has slowly shifted to the overall development of animal health sector in the country through strengthening of Veterinary Clinical Services. The animal health component complements the animal production, which is one of the important contributors to the country's socioeconomic development through income generation and food self-sufficiency. Animal health (along with nutrition and management) is directly linked to the productivity of the animals and the animal health in turn rely on the quality of the veterinary clinical services.

NVH is the referral center and lead agency for veterinary clinical services in the country and therefore, plays a major role in delivery and development of efficient veterinary clinical services in the country.

MISSION

Provide high quality and efficient veterinary clinical services to improve animal health and welfare.

VISION

Function as a model Veterinary Institution in providing state of the art Clinical Veterinary Services in the region.

MANDATES

- Provide high quality clinical veterinary services.
- Function as a national referral hospital for clinical veterinary services in the country.
- Function as an institute for capacity development in clinical veterinary services.
- Plan, coordinate, monitor and evaluate clinical veterinary services in the country.
- Support development of policies, strategies and plans for animal health.
- Support research on animal health.
- Act as pharmaco-vigilance centre for veterinary clinical services.

VETERINARY CLINICAL SERVICES

Various veterinary clinical services provided by NVH (but not limited to) are as follows:

- Consultation/ Treatment of sick animals
- Surgical interventions
- Sterilization
- Deworming
- Vaccination
- Registration of pet dogs and cats
- Referral services
- Technical backstopping on clinical veterinary services
- Issue of health certificates for pets
- Rescue and treatment (both domestic as well as wild animals) in collaboration with relevant stakeholders

ORGANOGRAM

After the completion and operationalization of the new veterinary hospital, a new organogram was proposed and endorsed through the 332nd HRC of the ministry held on 5th June 2018 to enable provision of efficient clinical veterinary services (Fig 1).

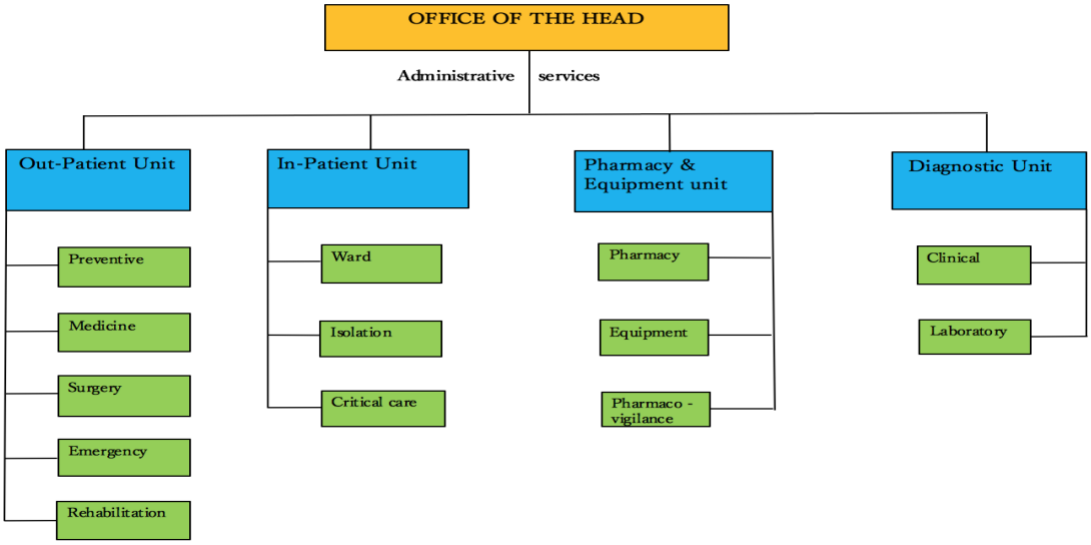


Fig 1: Organogram for National Veterinary Hospital

There are four Units; Out-Patient, In-Patient, Pharmacy and Equipment and Diagnostic. These units are further divided into 13 Sections. The new organogram is aimed at delineating various services under these sections and to delegate clear job responsibilities for efficient service delivery. Out of the 13 sections, the Critical care section has not been operational due to lack of advanced equipment that are needed for the purpose of critical care.

HUMAN RESOURCES

NVH has five Veterinarians, ten Para-veterinary professionals/ Animal Health Supervisors, three Assistant Laboratory Technicians and nine Non-technical staff (Fig 2). The non-technical staff comprise of a Senior Administrative Assistant and an Administrative Assistant/ Data manager. Rest of the support staff are six ESPs/ Animal attendants, one GSP and three drivers. Four new staff (1 Paravet and three ESPs) joined NVH during 201-19 (Table 1 & 2).

Fig 2: Existing human resource at NVH (names and designations)

Table 1: New Staff who joined NVH in 2018-19

Sl. No.	Name of staff	Date joined	Designation	Joined from
1.	Tara Man Gurung	15/12/2019	ESP	New recruitment
2.	Ugyen Phuntsho	1/7/2019	Driver	-do-
3.	Karma Lekshey	1/9/2019	ESP	-do-
4.	Pema Yangden	1/10/2019	ESP	-do-
5.	Moti Maya Ghalley	12/2/2020	LHS	Chukha Dzongkhag

WORKING HOURS

The National Veterinary Hospital provides regular services from 9am till 3pm during weekdays (Monday to Friday) and 9am till 1pm during Saturdays. During the weekdays and Saturdays, a para-veterinarian attends to the cases till 8pm and 5pm respectively after normal hours. During Sundays and government holidays, two Para-veterinarians provide off-hours services from 9am till 3pm. A veterinarian is called on duty when para-veterinarians are unable to handle the emergency cases. For any emergency cases beyond the given times, emergency cases are attended 24 X 7 (Table 2). However, the hospital is planning to provide 24 hours' services in the future.

Table 2: Working hours for NVH

Sl. No	**Day**	**Time**	**Off- hours**	**Emergency**
1	Monday to Friday	9am-3pm	3-8pm	24 hrs. on call
2	Saturday	9am-1pm	1-5pm	
3	Sunday & government holidays	9am-3pm		

5. PLANNED ACTIVITIES FOR 2019-20

The planned activities are those which are included in the Annual Performance Agreement signed between the Chief, Animal Health Division and the Head, National Veterinary Hospital during the start of the 2019-20 fiscal year. The achievements are covered in detailed reports under this chapter.

TRAINING WORKSHOP ON SOPS FOR VETERINARY CLINICAL SERVICES

As the referral center and custodian of veterinary clinical services, NVH had prepared SOPs for veterinary clinical services. Ever since, NVH has been actively involved in the training of field staff for effective implementation of these SOPs in their day to day discharge of clinical services. This year, two batches of SOP training were conducted in collaboration with RLDC Tshimasham and DVH, Thimphu. The proposed training for Eastern region could not be carried out due to the travel restrictions. The reports of the SOP training workshop are presented as under:

TRAINING WORKSHOP ON (SOPS) IN WESTERN REGION

(Date: 12th – 15th November 2019, Venue: TVH & SL, Phuntsholing)

Background

National Veterinary Hospital in collaboration with Regional Livestock Development Center, Tsimasham conducted **Training workshop on Standard Operating Procedures (SOPs) for Veterinary Clinical Services**" in Western region at TVH & SL, Phuntsholing from 12-15th November 2019. A total of 27 veterinary professionals from LECs/ DVHs under Western region were trained on the SOPs (table 4).

Modules and expected outcomes:

Table 3: Modules, topics and expected outcome of the SOP training

Module	Topics	Expected Outcome
I. Small Animal Practice	SOPs on case registration, consultation, surgery appointment, pet registration, treatment, de-worming, vaccination, anesthesia, surgery, customer care and clinical diagnostic services.	The participants will be able to fill up the pet details in the booklet, enter the information into the database and record cases in the register. Client communication skills, humane handling of pet animals and protocols on clinical diagnostic services, anesthesia and surgery will be established. Animal welfare promoted.
II. Farm Animal Practice	SoPs on registration, treatment, de-worming, vaccination, anesthesia, surgery, referral cases, emergency cases, mobile veterinary clinic and utilization of veterinary ambulance.	Participants will learn uniform and standard protocols on handling and clinical diagnostic protocols including treatment, surgery, de-worming and vaccination protocols for large animals at farm and backyard level. Animal welfare promoted.

Training materials and methods

- Power point presentations
- Mock drills
- Role plays
- Group works
- Practical class

Specific topics covered

Table 4: Various veterinary clinical SOPs covered during the training

1. SOP for Pet registration	2. SOP for Dispensing of medicines
3. SOP for Vaccination of pets	4. SOP for Deworming of farm animals
5. SOP for Vaccination of pets	6. SOP for Vaccination of farm animals
7. SOP for Case registration	8. SOP for Treatment of farm animals
9. SOP for Surgery appointment	10. SOP for Anesthesia of farm animals
11. SOP for Customer care	12. SOP for Surgery of farm animals
13. SOP for Consultation of pets	14. SOP for Referral cases
15. SOP for Treatment of pets	16. SOP for Emergency cases
17. SOP for Clinical diagnostic services	18. SOP for Utilization of veterinary ambulance
19. SOP for Anesthesia of pets	20. SOP for Mobile veterinary clinic
21. SOP for Surgery of pets	22. SOP for storage and management of medicines, non-drug items and equipment at DVHs and RNRECs/LECs

Findings from the training evaluation

1. Pretest versus posttest

Participants were made to fill up the pretest questionnaires before the start of the training workshop to test their knowledge on various aspects of the SOPs on veterinary clinical services. After the end of training workshop, the participants were made to fill up the same questionnaires again (posttest) to evaluate as well as compare their understanding on the SOP training that were provided. The result showed significant increase in the level of understanding (81%) after the training when compared to the result before the training (65%) and most of the participants scored 77% when compared to pretest score which was 67% (Fig 3).

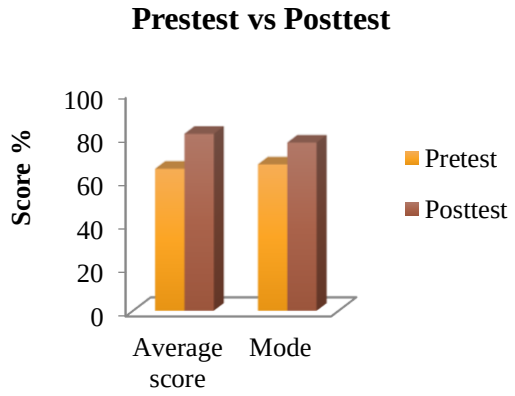


Fig 3. Comparative score for pre- and post-tests on SOPs

2. *Overall training evaluation*

The overall training outcome was evaluated based on 14 parameters and the participants rated against each of these parameters after the training. In total 95% of the participants were satisfied with the training program (Fig 4). The responses are captured in the following graphs.

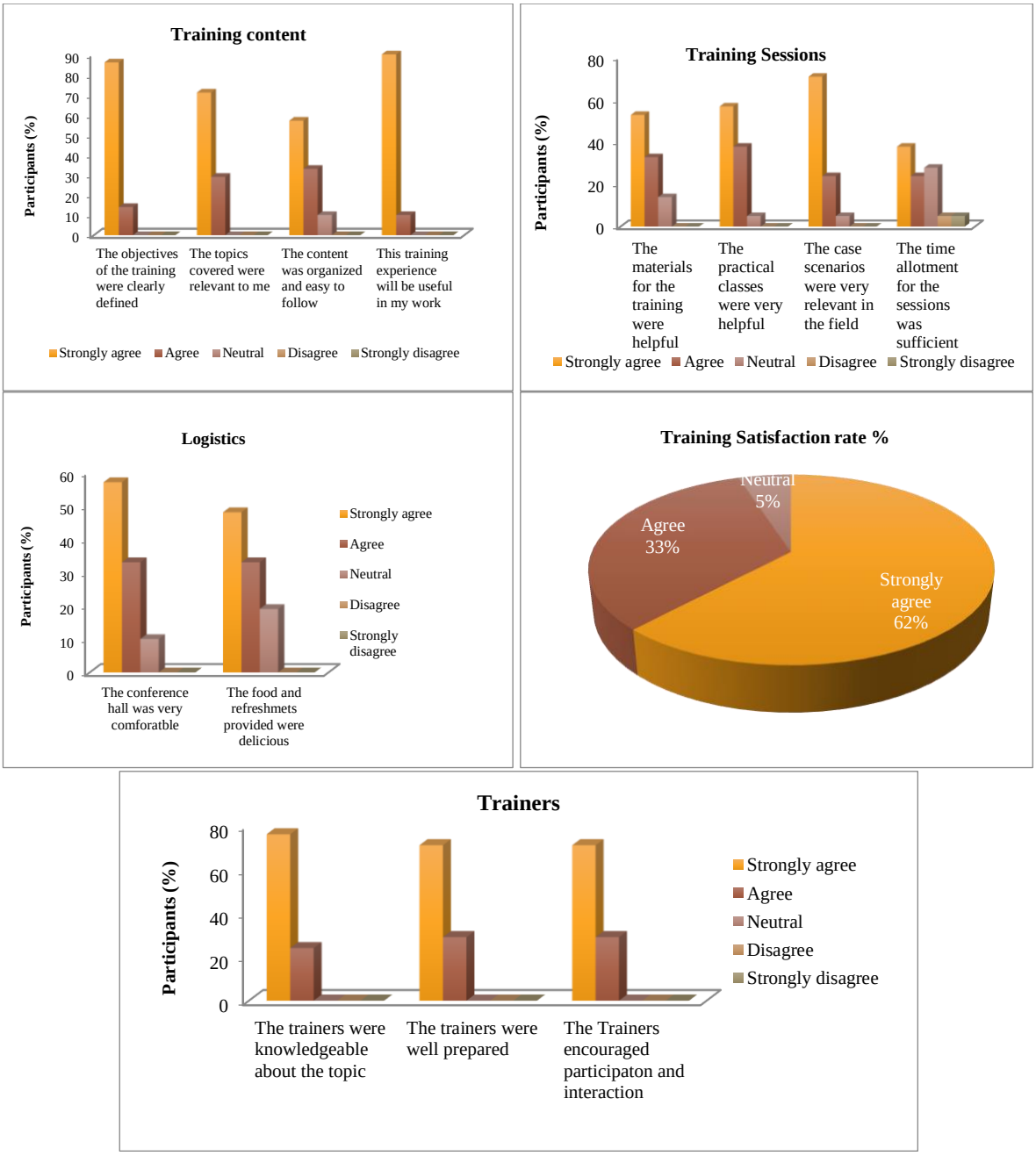


Fig. 4: Graphs showing various parametric evaluation for the training

3. Module specific training evaluation

- The following graphs illustrates participant's self-rating of their knowledge and understanding of the topics before the training and after the training (Fig 5). As evident from the graphs, there was significant improvement in their knowledge and understanding of the topics taught under each training module.

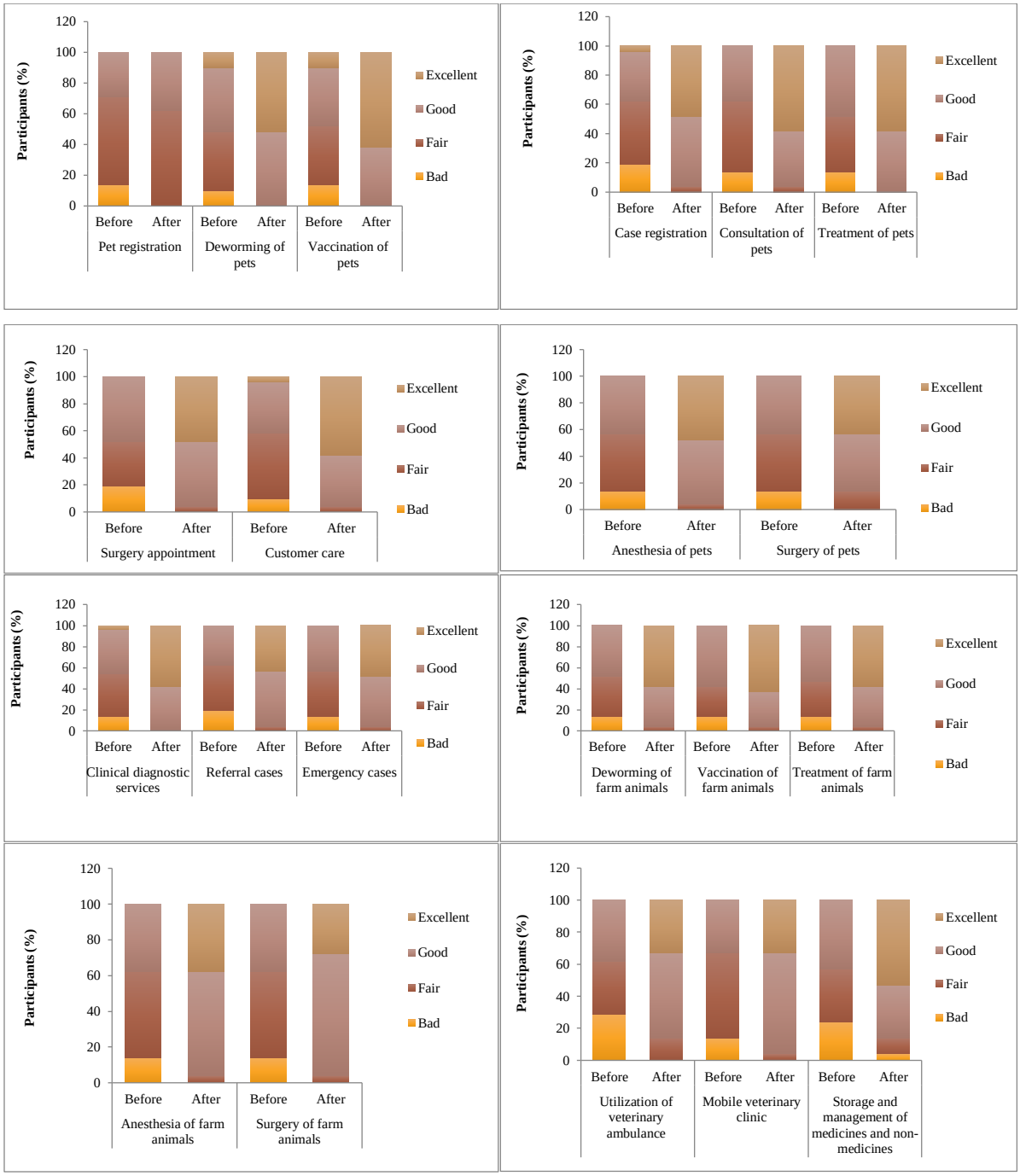
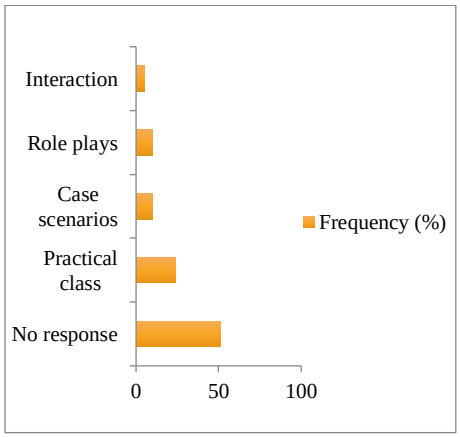
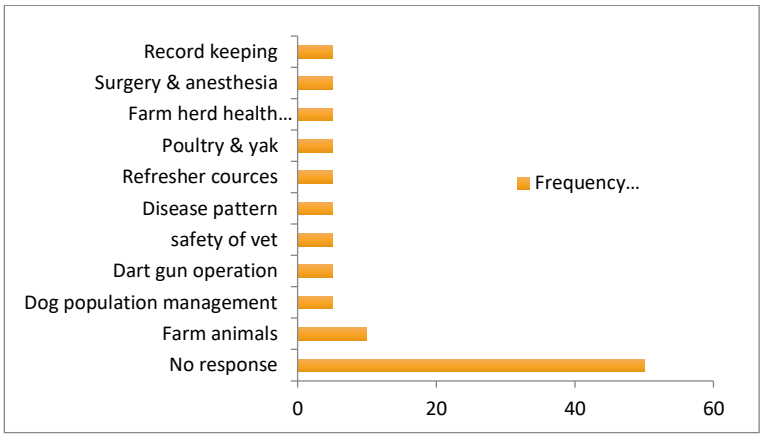


Fig. 5: Graphs showing evaluation of various SOP modules before and after the training

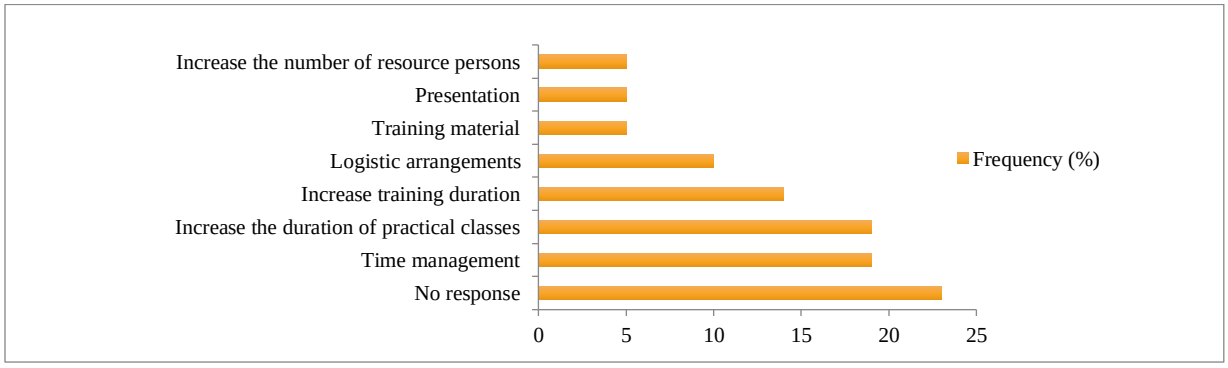
Thematic analysis of the open-ended evaluation questions

1. What did you like most about this training? *2.* Which topics do you think should be included in similar trainings in the near future?





3.What aspects of the training could be improved?



Resolution

1. All the SOPs shall be implemented in all the veterinary hospitals and animal health centers.

Action: DVHs and LECs with immediate effect.

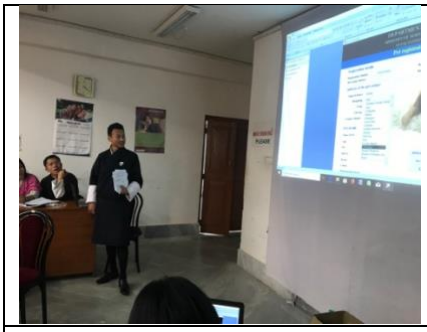
2. Respective VOs shall train those veterinary professionals under their Dzongkhag who have not availed training on the SOPs.

Action: VO, DVH with immediate effect.

Acknowledgement

NVH would like to thank the Department of Livestock and in particular the CVO, Animal Health Division for his continued guidance and steadfast support throughout the training program. Our sincere gratitude goes to RLDC, Tsimasham for sharing the expenses of the training program and for excellent coordination. We would also like to extend our appreciation to all the participants for their enthusiasm and active participation.

Photos from the training workshop



Lecture Presentations

Conducting a Pre-test

Role Playing

Presenting Video-clips

Physical exam of a dog

Physical exam of a cow

Surgical operation in a dog

Admnistration of fluid

Awarding of certificates

Table 5: Resource persons for the SOP training

Sl. No.	Name and Designation	Agency
1	Dr. Karma Rinzin, CVO	DoL, Thimphu
2	Dr. Basant Sharma, Regional Director	RLDC, Tsimasham
3	Dr. RB Gurung, Program Director	NCAH, Serbithang
4	Dr. Chendu Dorji, Sr. VO	RLDC, Tsimasham
5	Dr. Sangay Rinchen, Sr. VO	RLDC, Tsimasham
6	Dr. Nima Wangdi, Sr. VO	NVH, Thimphu
7	Dr. Jambay Dorji, Sr. VO	NVH, Thimphu

TRAINING ON SOP FOR THIMPHU DZONGKHAG LIVESTOCK SECTOR

(Date: 13-14th February 2020, Venue: DVH, Thimphu)

The DVH, Thimphu had requested NVH for training the technical staff under Thimphu Dzongkhag on Standard Operating Procedures for Veterinary Clinical Services. The training was conducted for the livestock field officers from eight gewogs including DVH staff under Thimphu dzongkhag Livestock sector from 13th – 14th February 2020 at District Veterinary Hospital, located at Rumtoktok, Thimphu. The training was funded by DVH, Thimphu and technical expertise provided by NVH.

The main objective of training was to provide livestock staff under Thimphu Dzongkhag to carry out standardized activities as prescribed in the SOPs for efficient service delivery. It will also enable quality, correct and consistent services and safety of the paraprofessionals during the implementation of daily routine activities in the field. It will also help in efficient utilization of limited government resources.

All the SOPs on veterinary clinical medicines were presented to the participants. Due to time constraint, the workshop was based mostly on theoretical presentations of the SOPs. A brief visit at the National Veterinary hospital was made to familiarize with the different sections performing different clinical activities.

Table 6: Participants for the SOP training

Sl. No	Name	Designation
1.	Mr. Pratiman Rai	LHS
2.	Mr. Phuntsho Namgay	LHS
3.	Mr. Namgay	LPS- I
4.	Mr. Karma Wangdi	Lab. Tech
5.	Mr. Nalikong	Sr. LHS
6.	Mr. Dawa Gyeltshen	LPS- I
7.	Mr. Kelzang Dorji	ES- I
8.	Mr. Rinzin Tsheten	LPS- I
9.	Mr. Kinzang Rabten	ES-I
10.	Mrs. Chador Wangmo	Sr. ES- II
11.	Mr. Namgyal Chencho	Sr. ES- II
12.	Mrs. Sherab Dema	LPS- I
13.	Mr. Namgay Phuntsho	Sr. ES
14.	Dr. Jigme Wangchuk	Sr. VO

Table 7: Resource Persons for the SOP training

Sl. No	Name	Agency
1.	Dr. Jambay Dorji	NVH
2.	Dr. Jigme Wangchuk	DVH, Tphu
3.	Phuntsho Dema	NVH
4.	Namgay Phuntsho	DVH, Tphu
5.	Sherab Dema	DVH, Tphu

MOBILE VETERINARY CLINICAL SERVICES FOR HIGHLAND AREAS

One of the mandates of NVH is to provide veterinary clinical services in highland areas where the access to animal health facilities as well as services are very limited due to unfavourable geographical conditions. As a part of the Highland services, NVH provides animal health consultations, medicines and other services as per their needs. In 2019-20, NVH team visited two highland areas; Soe, Thimphu and Laya, Gasa.

JUMOLHARI MOUNTAIN FESTIVAL

(14th-15th October 2020, Venue: Jumolhari)

Background

Jumolhari mountain festival was initiated in 2013 with the request from the local communities of Soe Yutey (Thimphu) and Soe Yaksa (Paro) who are residing in and around snow leopard areas. These snowcapped regions of the country serve as hot spot for the snow leopards, an endangered big cat species throughout the globe. The main objective of the festival is to celebrate the magnificent, beauty importance of conserving the snow leopard in glacier ecosystem and up lift the economy of the highlanders in and around this area through sales of their local products, horse and yak riding to the local visitors and tourist. It is also celebrated to please the deity

locally known as Ama Jomo which means “Mother Jomo” and it is considered sacred to the local communities.

The Jumolhari mountain festival was organized by Jigme Dorji Wangchuck National Park in collaboration with Thimphu dzongkhag and Lingzhi dungkhag and every year it is held at Jangkhothang (Jumolhari Base camp). Jumolhari mountain base camp is officially two days’ uphill hike from Shana, Paro where first night halted at Thanthangka and then to Jangkothang. The Lingzhi dungkhag administration took the lead in coordinating the various cultural and sports program in collaboration with gewog and dzongkhag administration.

Various programs were showcased during the 2 days’ festival such as local cuisine, showcasing local culture and tradition, yak and horse riding, cultural performance and sales of local products like ropes, bags, jackets etc. made from yak wool.

A team from NVH participated in the festival with the objective to provide veterinary clinical services to the highland people residing in the area. The team comprised of the following members: Dr. Nima Wangdi (Vet) - Team leader, Mr. Nidup Dorji (Paravet), Ms. Phuntsho Dema (Paravet) and Ms. Ludup Pelmo (Adm asst.)

The first day of the event was graced by honorable Minister of Health, Lyonpo Dechen Wangmo where hundreds of people from Soe Yutey and Soe Yaksa, tourists and local visitors gathered to witness the festival. The Hon’ble Minister highlighted the gathering on the importance of highland community, their culture and tradition in safe guarding sovereignty of the nation. She later visited all the stalls and interacted with the local people, tourist and civil servants present at the festival.

Services rendered by NVH Clinic:

- Sterilization of pets and community dogs
- Awareness on “GID” in Yaks and “strangles in Horses”
- Mass distribution of deworming medicines
- Minor wound treatments
- Distribution of antiseptics creams and solutions

Visit to NVH stall by Hon. Health Minister

Sterilizing a dog during the visit

4TH ROYAL HIGHLAND FESTIVAL, LAYA

The 4th Royal Highland Festival was held at Laya from 23-24th October 2019. Like in previous years, the highlanders from ten Dzongkhags participated in the festival to showcase as well as to sell their local produces. The festival had numerous entertaining programs such as exhibitions, animal shows, Bja displays, animal parades etc. The honorable Prime Minister graced the event.
Team from NVH had set up clinic at the festival to provide clinical services such as deworming, vaccination, general health check-up of the animals and treatment of sick animals. In total 50 yaks and 10 dogs were dewormed against endoparasites and were provided with ectoparasiticides (Deltamethrine solutions), mineral supplements and wound dressings materials such as ointments, antiseptic solutions, sprays and bandages. The team were also involved in judging of mastiff dogs, counting of votes and declaration of results during the festival.

Team members from NVH

Judges for Mastiff dog show

VETERINARY CLINICAL SERVICES

The primary veterinary clinical services provided by NVH are Vaccination, Consultation and treatment, Surgeries including sterilization and pet registration. The diagnostic services are provided through both laboratory and radio-imaging modes. Additionally, NVH also provides rehabilitation services for paraplegic animals with the help of radio/ light/ heat therapy and treadmill. Pet registration and vaccination services are provided during normal working hours only while sterilization services are provided during Tuesdays and Fridays based on the appointment system. Rest of the services are provided during both regular and off-hours.

The total number of cases received at NVH in 2019-20 was **20684** (table 8), which is about two and a half thousand more than the previous year (18121). 72 % (14379) of the cases were attended during regular hours while 27% (5406) were attended during off hours. Beyond regular and off hours, 193 emergency cases were attended which constituted 1% (Fig 6). NVH received nine Referral cases of which two were from Nature Conservation Division under the Department of Forest and Park Services while the rest were from various veterinary hospitals within the department of Livestock.

Table 8: Various Cases attended during different time schedule

Types of cases	**Numbers**
Regular hours	14379
Off- hours	5406
Emergency (beyond regular and off-hours)	193
Referral cases	9
Outdoor cases	316
Royal cases	381
Total	**20684**

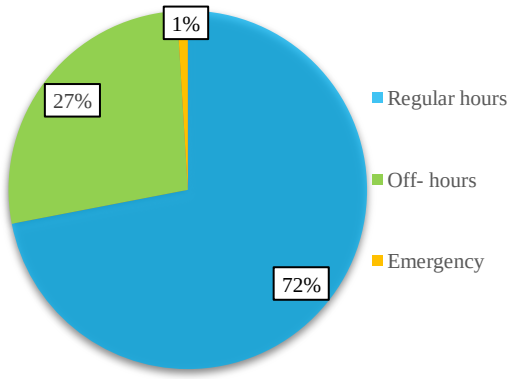


Fig 6: Cases attended at different time schedule

CLINICAL CASES

A total of **6552** new cases were brought to NVH in 2019-20. The **14132** registered cases were the repeat/ follow up records of these new cases. As per the VIS classification format, cases were classified into various systemic disorders (table 9). Maximum number of cases were related to digestive system disorders followed by musculoskeletal system and skin affections respectively. The least number of cases were affections related to the urinary system followed by poisoning.

Under the specific infections, **543** were Canine distemper cases. This year, there has been an outbreak of canine distemper affecting mostly stray dogs because they are not vaccinated against the Canine Distemper virus.

Table 9: Various cases brought at NVH

Disorders 2019-20	No of new cases
Digestive conditions	1713
Respiratory conditions	128
Reproductive conditions	64
Skin affections	1020
Musculoskeletal conditions	1339
Urinary conditions	28
Circulatory conditions	176
Nervous disorders	60
General conditions	466
Eyes and ear affections	319
Metabolic and deficiencies	48
Poisoning	38
Specific infections	578
Parasitic diseases	519
Worm infestation	56
Total	**6552**

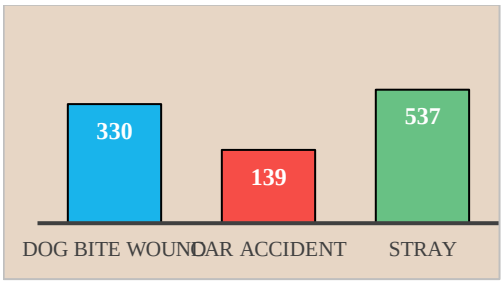


Fig 7: Dog bite, car accident and stray cases

In 2019-20, 330 cases of dog bite wounds were reported, which is an increase of 57 cases compared to previous year (273). Vehicular trauma is also frequently received at the hospital and this year, 139 cases related to vehicular accidents/ trauma were registered at NVH. This is 39 less than last year (168). Animals being hit by vehicles are mostly strays dogs and cats.

Due to increased vehicular traffic and free roaming stray dogs, increased incidences of vehicular trauma are reported. Vehicular trauma most commonly leads to musculoskeletal and neurological disorders in the animals. For these patients, additional care with physiotherapy yields good results. Physiotherapy through laser/ light and ultrasonic radiations in conjunction with treadmill exercises are provided to such patients. In 2019-20, a total of 191 physiotherapies was provided (fig. 8). Most number of physiotherapies were done on the dogs while cat had only three physiotherapy conducted.

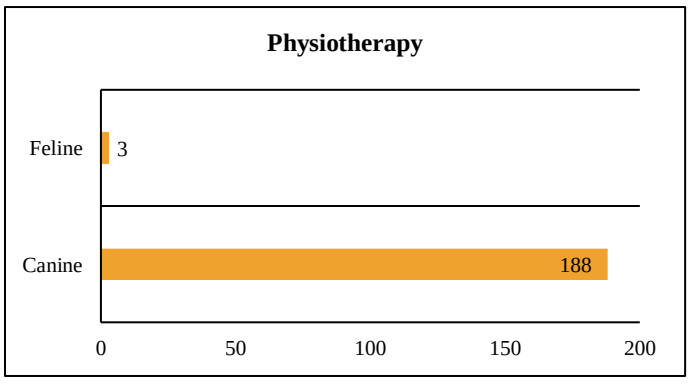


Fig 8: Bar graph for canine and feline physiotherapies

A dog walking on the treadmill

SURGICAL CASES

Various surgical cases were presented at NVH during 2019-20. A total of **1258** surgical cases were recorded (table 10 & fig. 9). Generalized wound treatment was recorded highest (819) followed by dog bite wounds (330). Cherry eye (27) and hernia (20) were also commonly presented. Due to increase in vehicular trauma, fractures cases are commonly observed. Therefore, NVH has carried out more bone pinning surgery (9) in 2019-20 which is double than the previous year (4). Amputation (10) of limbs were also conducted in cases where the limbs were beyond treatment/ recovery. A solitary case of rectal prolapse correction and mammary tumour removal were recorded. Dental scaling service as a part of pet's oral health care was also provided to four dogs with dental plaque and gum disease.

Table 9: Various Surgical affections

Surgical cases	**Numbers**
Mammary Tumor	2
Hematoma	11
Papilloma	12
Dog bite wounds	330
Other wounds	819
Cherry eye	27
Hernia	20
Amputation	10
Bone pining	9
Rectal Prolapse	1
Dystocia	13
Dental scaling	4
Total	**1258**

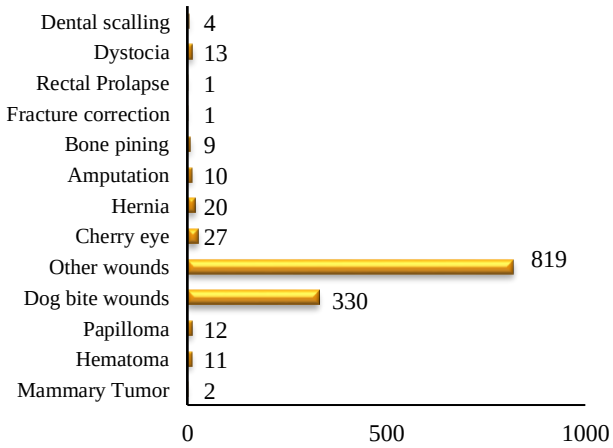


Fig 9: Bar graph showing different kinds of surgical affections

Before and after pics of dental scaling in a dog



IM bone pinning in a cat – after recovery

STERILIZATION

NVH provides routine sterilization services to the pet animals twice in a week. This year, NVH sterilized **773** animals, especially dogs and cats (table 10 & fig. 10). Four Royal stallions and five bulls were also sterilized. The overall proportion of castration was almost one fourth (29%) compared to ovariohysterectomy which was nearly three fourth (71%) of the total sterilized.

Out of the total pet dogs brought for sterilization at the hospital, Ovariohysterectomy (347) was more than double than the castration (142) whereas, in cats, castration was only about one third (74) compared to ovariohysterectomy (201).

Some pet owners prefer non-invasive method of birth control. As an alternative to surgical method of sterilization, oral and injectable contraceptive (Medroxyprogesterone) are also provided. A total of 59 pet dogs and cats were given contraceptive treatment in 2019-20. In the previous year, 81 pets were treated with medroxyprogesterone.

Table 10: Sterilization types in different animal species

Species	Castration	Ovariohysterectomy
Dog	142	347
Cat	74	201
Horse	4	0
Cattle	5	0
Total	225	548

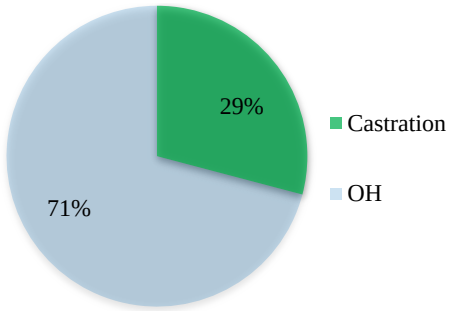


Fig 10: Pie chart for castration and OH

Outdoor surgeries (Castration of a bull and neutering of community owned dogs)

VACCINATION

There are two types of vaccines available for dogs (DHPPi+L and ARV) while cats are provided with only ARV. A total of 2594 pets were vaccinated with Anti-Rabies vaccine of which 2128 were dogs and 405 were cats (table 11). About **2428** pet dogs were also vaccinated with DHPPi + L vaccines. Poultry birds belonging to the Royal family were vaccinated against Marek (60) and Newcastle (129) diseases (fig 11).

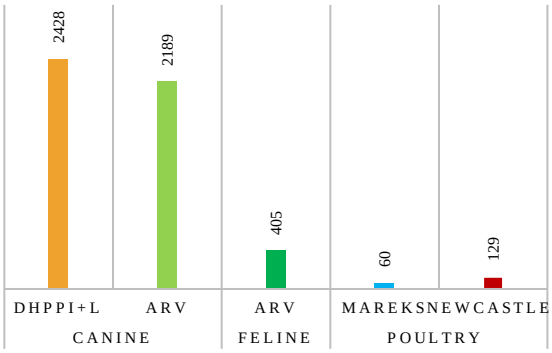


Fig 11: Bar graph for vaccinations in different species

Species	Vaccination	Numbers	Total
Canine	DHPPi+L	2428	2428
	ARV	2189	2594
Feline	ARV	405	
Poultry	Marek	60	60
	Newcastle	129	129

Table 11: Vaccination details in different species

PET REGISTRATION

Only dogs and cats are registered at NVH. During 2019-20, a total of **1630** pets were registered, out of which 1197 were dogs and 433 were cats (table 12). The proportion of pet registration for dogs to cats is almost 3:1. Out of the total registered pets, 22 were for Royal pets while 1608 were for public. The new pet registration as well as renewal for dogs and cats were both higher for 2019-20 compared to 2018-19 (fig. 12).

Table 12: Pet registration details for 2019-20

Pet Registration	New		Renewal	Registration type	Numbers
	Male	Female			
Dogs	659	538	1723	Royal	22
Cats	175	258	140	Public	1608
Total	834	796	1863	Total	1630
	1630				

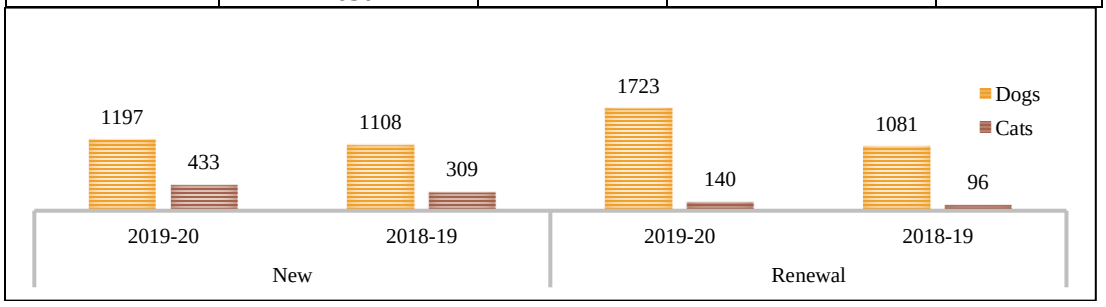


Fig 12: New and renewal pet registration for dogs and cats for 2018-19 and 2019-20

Various breeds of dogs were brought for registration. The highest breed registered was local dogs (294), while the lowest was American bully, French Mastiff, Great Dane and Rottweiler at one each (appendix 3). The cat breeds were only Local, Persian and Persian cross breeds.

During the registration of pets, a registration fee of Nu. 100/- is collected to recover the cost of printing registration booklets. A sum of Nu. 1,55,800/- was collected as pet registration fees, which is higher than the previous year (***Nu. 1,18,100/-).*** The amount is deposited as revenue with the government.

DEWORMING

A total of **4751** animals were dewormed. Of the species dewormed, dogs were the highest at 3845, followed by cats at 895 (table 13 & fig 13). Only 11 Cattle were dewormed, which can be attributed due to the dwindling population of cattle in and around the Thimphu municipality.

Table 13: animal species dewormed in 2019-20

Species	**Numbers**
Dog	3845
Cat	895
Cattle	11
Total	**4751**

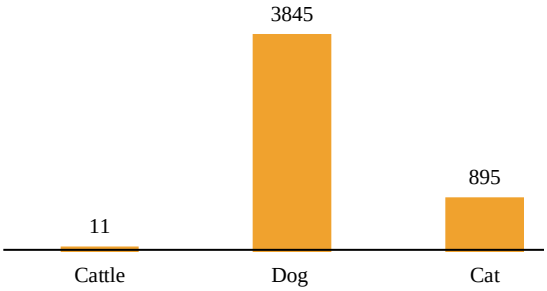


Fig 13: Bar graph of deworming in different animals

DIAGNOSTIC SERVICES

Diagnostic services are divided into two components: Clinical and Laboratory.

CLINICAL DIAGNOSTICS

In 2019-20, 180 ultrasonography services were provided to the pets. Out of that, 97 were for pregnancy diagnosis and 83 were for exploratory or general exam purposes (fig. 14). Currently, only ultrasonography services are provided. Ever since NVH received the Ultrasonography machine in 2017, the machine was being used to diagnose pregnancy in bitches and queens. After the Ultrasonography training in 2018, it's being used for examination of other organ systems. The clinical diagnostics at NVH shall comprise of Ultrasonography, endoscopy and X-ray services in from the coming year. With the budgetary support from RGOB, NVH has ordered for a Doppler ultrasonography machine, which is an advanced machine that can even detect the abnormalities in the circulatory system. It can also be used in investigating the status of fetuses' health through its blood flow studies. With the support of RGOB, NVH has also procured a Digital X-ray Machine and Video-endoscope. The diagnostic capacity shall be enhanced once they are operationalized and necessary training acquired on their use and interpretations.

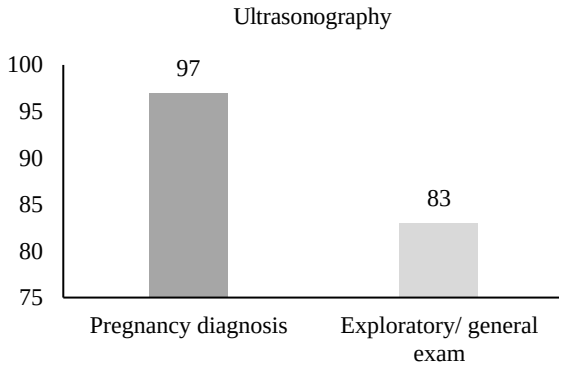


Fig. 14: Ultrasonography in pets

Cases which needed help of radiographic images for confirming the diagnosis were sent to Maya Foundation, Paro for assistance with her radiographic services. A total of about 20 cases were sent to Paro for X-rays.

Pyometra image in ultrasonography

X-ray images of bilateral fractures of femurs (dog),

X-ray image of a Spinal fracture in a cat

X-ray image of a face of a dog

LABORATORY DIAGNOSTICS

The laboratory service unit (LSU) collected/received a total of *1697* samples and performed 2,306 tests in three sections: Parasitology, Hematology and Biochemistry (fig 15). A total of 134 samples were also referred to National Centre for Animal Health (NCAH) especially for fungal and bacterial culture and identification, and antibiotic sensitivity test (ABST), histopathology and post mortem examinations (table 14).

Table 14: various samples referred to NCAH

SI.no	Types of sample	No. of samples referred
1	Skin scrapings	90
2	Swabs	21
3	Ascitic fluid	2
4	Whole blood	1
5	Serum	3
6	Histopathological (tumor)	1
7	Postmortem	16
	Total	134

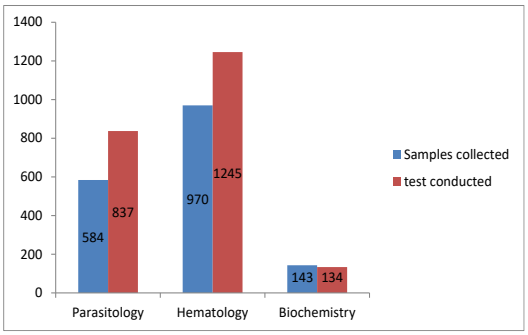


Fig 15: No. of samples received and tested

Parasitology Section

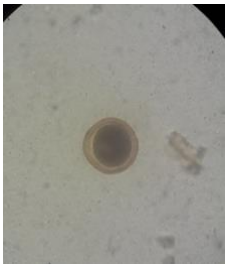
The parasitology section collects and examines samples like fecal, skin scrapings, and whole blood for diagnosis of various parasitic affections. Total of 223 faecal and 244 skin scrapings were collected out of which 110 faecal samples and 69 skin scraping samples were positive for external parasites. The negative samples suspected of fungal and bacterial infection were referred to NCAH for culturing.

Various parasitic eggs/ larva were identified in these samples as shown in (table 15). The common gastrointestinal parasites found in dogs and cats were *Toxocara Canis and T. cati* followed by *Isosopra Spp* and *Ancylostomum spp*. The skin scrapings were mostly positive to Demodex (46), Sarcoptes (11) and Psoroptes (4).

Table 15: GI parasites in different species of livestock

Species	Parasites
Canine	*Toxocara canis, Isospora spp., Ancylostoma caninum, Dipylidium spp., Strongyle spp., Spirometra spp., Trichuris vulpis., Uncinaria spp.*
Feline	*Toxocara cati, Ancylostoma spp., Dipylidium spp.*
Bovine	*Strongyle spp., Ascaris spp., Balantidium coli, Fasciola spp., Dicrocelium spp.*
Equine	*Strongyle spp.*
Caprine	*Strongyle spp.*
Avian	*Capillaria spp., Ascaridia spp.*

Dipylidium caninum egg



Ascaris canis egg

During 2019-20, NVH collected and referred 21 swab samples from wounds to NCAH for bacterial culture, isolation and identification. *Staphylococcus intermedius* was the predominant bacterial species causing wound infections. 90 skin scraping were also referred and the predominant fungal species isolated were *Aspergillus fumigatus* and *Rhizopus spp*.

Hematology

For hematology, a total of 970 blood samples were collected out of which 1245 tests were conducted (table 16). A total of 524 whole blood samples were collected out of which 473 Differential leukocyte count, 326 Hemoglobin tests and 446 Direct Smear were made for examination of blood parasites and heart worms.

Table 16: Various tests performed in hematology

No. of samples collected	No. of test conducted	Type of test conducted
524	326	Hb/dl
5	473	DLC
441	446	Direct smear
970	1245	

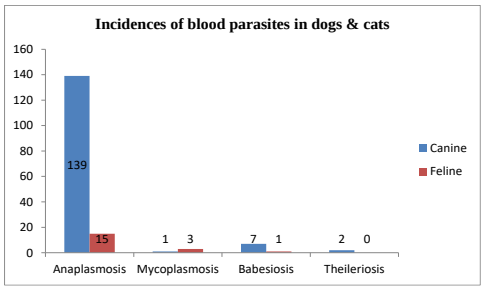


Fig. 16: Blood parasites in dogs and cats

A total number of 446 samples were processed and screened for blood parasites, out of which 168 samples were seen positive to various blood parasites (*Anaplasma spp.*, *Babesia Spp*, *Theileria Spp.*). Anaplasmosis was the dominant blood borne infection both in dogs and cats with an incidence of 139 and 15 cases respectively followed by Babesiosis (fig. 16).

Biochemistry

The biochemistry section conduct tests for clinical biochemistry in serum and also qualitative analysis of urine to support the clinical diagnosis. Total of 134 serums were collected for conducting the biochemistry tests. The biochemistry test is very important to know the renal and hepatic functions along with blood glucose, cholesterol, bilirubin, enzymes and some important minerals.

MEDICINE UTILIZATION

During 2019-20 a total of 107 different medicines amounting to Nu. 6,13,140.31 were received while in 2018-19, it amounted to Nu. 4, 61,248/-.

Ibuprofen tablets worth Nu. 1072.5 from previous indent (2018-19) and four other medicines: Amikacin, Methycobalamin (Neuroxin), Metoclopramide and Vitamin B-complex injection amounting to Nu. 7190.00 expired from the 2019-20 indent. Therefore, the total amount of expired medicines was Nu. 8262.5/- which translates to expiry rate of 1.34%. The expiry rate was only 0.02% in the previous year.

Medicine utilization percentage in 2019-20 was 84.82%. It was 73.6% at the same time in 2018-19.

The ten most commonly used medicines for 2019-20 are summarized in the table 17. The utilization is ranked based on the quantity received and their proportionate use. The quantity received varies between different medicines and therefore, also influence their utilization, affecting the final percentage of usage. However, it is only meant for investigating the efficiency of use against the individual drug over its stock volume. Metronidazole inj. was used the highest (120%) followed by Diazepam inj. and Normal saline at 100% each. The deworming tablet of Praziquantel and Fenbendazole combination stands at number 10 with 52% usage (table 17).

Table 17: The ten most utilized medicines in 2019-20

Sl. No	Medicine	Received	Used	% Used
1	Adrenaline	350	300	86
2	Dextrose 5%	540	340	63
3	Dextrose Normal Saline	606	556	92
4	Diazepam	272	272	100
5	Metronidazole inj.	318	382	120*
6	Normal Saline	308	308	100
7	Povidone iodine	750	700	93
8	Praziquantel & Fenbendazole	629	329	52
9	Ringers Lactate	947	692	73
10	Strepto-penicillin intrammary	265	265	100

** The usage % of more than 100 is indicative of external mobilization from other centers*

19 different types of antibiotics were received by NVH (table 18). 12 antibiotics were fully utilized including Metronidazole inj. (120%) which was mobilized additionally from other animal health centers. Oxytetracycline (long acting) injection was the least used antibiotic of all (12%). This could be attributed to the decreasing population of large animals in Thimphu city since it is used in large animals only.

Table 18: Antibiotics used at NVH during 2019-2020

Sl. No.	Antibiotic	Qty Received	Qty Used	Balance	% Usage
1	Amikacin	38	13	25	34
2	Amoxycillin Trihydrate bolus	17	17	0	100
3	Ampicillin & Cloxacillin	146	146	0	100
4	Benzathine-Penicillin	70	70	0	100
5	Cefotaxime	50	50	0	100
6	Ceftriaxone	33	33	0	100
7	Ceftriaxone & Tazobactum	20	20	0	100
8	Cephalexin bolus	75	75	0	100
9	Cephalexin powder	33	33	0	100
10	Doxycycline tablet	85	65	20	76
11	Enrofloxacin injection	115	105	10	91
12	Enrofloxacin tablet	165	145	20	88
13	Gentamicin 1njection	315	215	100	68
14	Metronidazole injection	318	382	0	*120
14	Oxytetracycline LA	25	3	22	12
15	Oxytetracycline SA	53	53	0	100
16	Streptomycin	30		5	83
17	Strepto-penicillin	128	53	75	41
18	Sulhadimidine	20	20	0	100
19	Tetracycline HCL	5	5	0	100

**The usage % of more than 100 is indicative of external mobilization from other centers*

PHARMACOVIGILANCE – ADVERSE DRUG REACTION

As the Pharmacovigilance center for animal health, NVH is mandated to oversee pharmacovigilance activities in the animal health sector across the country. Compilation of ADR reports is an important aspect to the Pharmacovigilance activity.

Eleven adverse drug reactions (ADR) were recorded at NVH of which one case was reported from Punakha DVH (table 19). Six cases were from dogs while five were observed in cats.

Except for one case, rest of the cases recovered without any complications after the cause of ADR was discontinued and appropriate treatment provided. One case however died.

Adverse Effect following vaccination (AEFI) were also reported in two animals (one each in a dog and cat) (table 20). The reactions were caused by anti-rabies vaccine. After the necessary treatment were given, the symptoms disappeared.

Table 19: Adverse drug reaction (ADR) in dogs and cats

Sl. No.	Species	Breed	Drug used	Indication	Reaction	Response
1	Canine	Apsoo	Vincristine Sulphate inj.	TVT	- Sloughing-off of skin at the site of injection (both fore limbs) *(patient was referred from Punakha DVH)*	- ASD of wounds
2	Canine	Labra-dor	Multi-vitamin inj.	General Weakness	- Swelling of face - Inflammation of skin - Increased respiration	- Inj. CPM
3	Canine	TM cross	Vitamin A inj.	Hypo-Vitaminosis - A	- Champing of mouth - Skin wrinkles - Muscular in-coordination - Dehydration	- Inj. NS - Inj. CPM
4	Canine	Apsoo cross	Syrup multivitamin	Inappetance	- Swelling of face	- Medication discontinued
5	Canine	Apsoo	Gentamicin inj.	Kennel cough	- Lethargy (inactive for 4hrs after injection)	- Monitoring Observation
6	Canine	local	Imidocarb inj.	Babesiosis	- Panting, salivation, restlessness	- Inj. Atropine sulphate
7	Feline	Local	Gentamicin inj.	Dog bite wound	- Swelling of face	- Inj. CPM
8	Feline	Local	Praziquantel tab Ivermectin inj.	Deworming	- In-coordination - Diarrhoea - Coma	- Fluid therapy, B- complex inj.
9	Feline	Local	Praziquantel tab Ivermectin inj.	Deworming	- In-coordination - Diarrhoea - Coma	- Fluid therapy - B- complex inj.
10	Feline	Local	Praziquantel tab Ivermectin inj.	Deworming	- In-coordination - Diarrhoea - Coma	- Fluid therapy - B- complex inj.
11	Feline	Local	Inj. B-complex i/v	Enteritis	- Death	

Table 20: Adverse Reaction Following Vaccination

Sl. No.	Species	Breed	Indication	Vaccine used	Reaction	Response/remarks
1	Canine	TM	vaccination	Anti- rabies Vaccine	- Facial edema - Allergy	- Inj. CPM - Inj. Prednisolone
2	Feline	Persian cross	Annual vaccination	Anti-rabies vaccine	- Pea size lump on the site of injection (reported after 2 days)	- Inj. CPM

BUDGET UTILIZATION

A total of Nu. 28.702m was approved for NVH during 2019-20 fiscal year. **Nu. 28.011m** was used and the balance amount was **Nu.0.691m** (Table 21 & annexure 2). The budget utilization percentage was **97.60%** which is an improvement from the previous year at 95.13 %. NVH has been fortunate to receive budgetary support from RGOB to procure advanced equipment like X-ray, Doppler Ultrasonography machine and Video-endoscope. Through RDCCRP support, equipment for microbiology lab were also procured.

Table 21: Approved Budget for NVH, FY 2019-20 (Nu in million)

Sl. No	Title	Budget	Used	Balance
1	Personal emoluments	10.275	10.273	0.002
2	Operation and management services	5.453	5.404	0.049
3	Animal health- dog and cat population management and rabies control program	0.062	0.060	0.002
4	National pharmacovigilance center for veterinary services	0.080	0.052	0.028
5	Mobile clinic for Highlanders program	0.160	0.156	0.004
6	Procurement of Veterinary Equipment	10.470	10.464	0.006
7	Procurement of laboratory equipment (RDCCRP)	2.200	0.1.600	0.600
	Total (Nu in M)	28.702	28.011	0.691
	Utilization %	**97.60%**		

CLIENT SATISFACTION RATE

Client satisfaction rate is "a measure of how products and services provided by a center meet or surpass client expectations. It is about whether or not service provider succeeds in making the clients happy. Since we are public servants, we must ensure that the services that we provide to our clients are of high standard and that they are satisfied with the services received. Client satisfaction rate (CSR) is determined by the service providers' work ethics, professionalism and integrity at an individual level. At the agency level, it is determined by the facilities and the overall management system. The level of the CSR will help in making assessment and recommendations for improving the efficiency of the services provided.

The CSR was determined through a set of questionnaire filled by the clients who came to avail the veterinary clinical services at NVH. A set of five questions were designed to enable clients to provide their ratings. The criteria for the questions were based on the following parameters:

Q1. Friendliness/ politeness of the staff

Q2. Professionalism

Q3. Facilities available at the hospitals

Q4. Promptness with which staff provide the services

Q5. Waiting time for availing the services

Each question (Q1 to Q5) had a scoring scale from 1 to 10, 1 being very poor and 10 being Excellent. Question 6 was an open ended question to collate comments and suggestions to further enhance the services.

A total of 75 clients filled the questionnaire and analysis was done on the Excel spreadsheet. For 2019-20, the CRS for NVH was calculated at 86.4% (table 22). The CSR for 2019-20 is 86% which is higher than the previous year (84%).

Table 22: Comparative ratings on the questionnaires for 2018-19 and 2019-20

Year/ Qs	Q1	Q2	Q3	Q4	Q5	Average
2018-19	85.6	85.2	85.9	84.6	78.6	**84.0**
2019-20	89.1	86.4	85.7	85.3	85.2	**86.4**

The highest rating this year was for *Q1 (Staff friendliness)* compared to previous year which had *Q3 (facilities).* Lowest rating was for *Q5 (waiting time)* for both the years. The longer waiting time could be attributed to increasing number of cases each year coupled with inadequate staff to provide prompt services.

STAFF COORDINATION MEETING

Staff coordination meetings were conducted to improve on the efficiency of service delivery and at the same time discuss issues to come up with suitable solutions and/ or way forwards for better performances and outcome. During 2019-20, five staff coordination meetings were conducted (table 23).

Table 23: Summary of various staff coordination meetings conducted in 2019-20 and their agenda

Sl. No	Meeting/ agenda	Date
1.	(Final IWP/ APA review meeting) - Overview of annual progress report - Presentation on IWP achievement for all staff - Presentation on APA achievement for 2018-19 - Setting of APA targets for 2019-20 - Allocation of duties/ responsibilities - Other issues and discussions	9th August 2019
2.	- Mid-term review of IWPs and APA of NVH	28th January 2020
3.	- Shortages of consumables - Office timing - Staff uniform - Leaves - Evaluation of incomplete scheduled activities - Preparation of Dr. Kinley's farewell	3rd March 2020
4.	(COVID emergency meeting) - Brief awareness and update on COVID-19 - Temporary measures taken at NVH to prevent COVID-19 - Continuity of service delivery (CSD) plan - Budget utilization for suspended activities - AOB	30th March 2020
5.	COVID19 – Continuing Service Delivery meeting - CSD interim rooster - Requirement of Veterinarian during off hours, Sundays and Government holidays - Information sharing regarding approved annual budget and its utilization - Concrete action based resolution to be drafted and reviewed in the following meeting - Highland activity - AOB	11th April 2020

COVID19 emergency and Continuing Service delivery meeting summary

As advised by the RCSC, the meeting deliberated on the continuity of the service delivery amidst the COVID19 pandemic uncertainty. Identification of critical services, their modalities and way forwards for the suspended activities were discussed.

i. Identification of services (critical/ essential, remote and non-essential)

As per RCSC's recommendation, the hospital had categorized its workplan activities (as reflected in APA 2019-20) into three categories (table 24).

Table 24: Categorization of services/ activities

1. Services that are critical and require physical presence	
i.	Clinical cases (vaccination/ pet registration/ consultation/ treatment/ surgeries/ sterilization/ critical care/ diagnostics
ii.	Laboratory sampling/ examination/ reporting
iii	Updating on VIS
2. Services that can be provided remotely	
i.	Technical backstopping on Veterinary clinical Services and Case referrals
ii.	Revise and develop ADR/AEFV guidelines
3. Services that are not critical and can be suspended	
i.	Training of field staff on SOPs of veterinary clinical services in collaboration with RLDC
ii.	Mobile Veterinary clinical services in highland area
iii.	Monitoring of pharmaco- vigilance activities
iv.	Collaborative mass sterilization of dogs
v.	Getting approval from GNHC for implementation of CRS at NVH
vi.	Review of CAHWs

ii. Modalities; essential services

For the critical services modalities were discussed and finalized as follows

- Vaccination (along with pet registration) is clubbed under essential services since vaccines prevent animals from acquiring diseases and maintain their health and welfare. House-call vaccination service was proposed but for the welfare of the staff (who will have numerous contacts and with a possibility of risk) the floor decided to review at a later stage, if necessary.
- Other clinical services classified under essential services (requiring physical presence) include Consultation, Treatment including surgeries, Critical Care and Diagnostics (laboratory and clinical).

- To ensure social distancing/ physical crowding at the hospital, the hospital will provide appointment system for clients so that they can come at the given time to avail the services.
- The clients will be advised to consult Veterinarians before bringing their pets to the hospital to help reduce the number of people/ animals coming to the hospital. Pet animals which are not sick will be discouraged to bring at the hospital and necessary consultation/ advises shall be provided over the phone to the owners.
- Awareness on the hospital's plans will be advertised through BBS and hospital's Facebook page. All the staff are requested to share the information as much as possible to obtain maximum coverage.
- From 6th April 2020, the available staff will be divided into two groups to work from 9am till 9pm which will enable the appointment system for clients are effectively managed. The roster will be prepared accordingly for the two groups (9am-3pm and 3pm-9pm). Emergency cases beyond this time will be attended by the Doctor on-call as practiced now.
- For the time being, while clients/ public are being informed of the change in service plans, the staff of NVH will be divided into two groups and rostered on alternate days to attend to the clinical cases.

iii. Preparedness in case of lockdown (OPD/ elective surgeries/ emergency etc)

In the unforeseen event, where the country has to initiate Lockdown *(God forbid)*, the hospital will cater to only following services:

- ***Emergency services*** to critical patients
- ***House- call*** vaccination services (will depend on severity of lock down/ movement restriction)
- ***Consultation*** with Vets over the phone (24 hrs access)

iv. Budget utilization for suspended activities

Several activities (especially those which needed gathering and travel) were suspended for 2019-20. For effective utilization of the earmarked budget, the budget were re-appropriated and used for other activities.

Temporary measures taken at NVH to prevent COVID-19

As an outcome of the COVID19 emergency meeting, several measures as recommended by the Ministry of Health were instituted at NVH to safeguard and prevent the potential spread of the virus amongst the staff and the clients visiting the hospital as follows:

i. Physical distancing (markings/ taping)

Red marks/ cello tapes were placed on the floors in front of various sections (reception, vaccination, consultation, treatment and on waiting chairs) at the hospital to ensure people are not close to each other and maintained appropriate physical distances.

- The respective incharges were asked to ensure that people are not crowded and adhere to physical distancing initiated at the hospital premises.
- One ESP designated at the entrance to ensure pet animals brought to the hospital are accompanied by only one person to prevent crowding inside the hospital.
- A Thermometer gun was procured to check the body temperature of the clients/ visitors to the hospital.

ii. Frequent disinfection of hospital premises

- The hospital floors, treatment tables and door knobs are frequently disinfected/ cleaned since these surfaces are in maximum contact with animals and clients.
- The hospital installed a water tank near the hospital entrance to encourage and enable clients for easy access to proper hand washing.
- A disinfectant foot dip was installed at the entrance to disinfect people entering and exiting the hospital.

iii. Distribution of face masks, gloves, hand sanitizers

For the safety of the staff, face masks, gloves and hand sanitizers were procured in sufficient quantity. Dettol soaps were placed in the bathrooms for effective hand washing and hand sanitizers kept at the reception all sections of the hospital for effective hand disinfections of both staff and the clients.

6. UNPLANNED ACTIVITIES

The unplanned/ ad-hoc activities are listed below as a summary (Table 25 & 26). They are divided into In-country and Ex-country as most of these unplanned activities were carried out either within or outside the country in the form of trainings, workshops or tours.

IN-COUNTRY MEETINGS/ WORKSHOPS/ TOURS

Table 25: In-country trainings/ workshops attended outside of the planned activities

Sl. No.	Name of Workshop/Training/meeting	Venue	Date	Name of Staff who attended
1	Detailed Technical Implementation Plan (DTIP)- by Fleming Fund	Paro	11 to 13 July 2019	Dr. Pema Tshewang Dr. Nima Wangdi
2	Regional Review and Planning Workshop conducted by RLDC, Tshimasham	Phuntsholing	July 29 to 2nd August 2019	Dr. Pema Tshewang
3	First Technical Working Group meeting -by Fleming Fund Project	Paro	23 to 28 Aug 2019	Dr. Pema Tshewang
4	Hands-on training on tick identification	NCAH, Serbithang	25 to 27 Sept 2019	Dr. Meena Devi Samal
5	AMR Technical Committee meeting -Fleming Fund Project	Phuntsholing	24 to 26 Oct. 2019	Dr. Pema Tshewang
6	Workshop on Veterinary professionals on Pharmaovigilance	Lobesa, Punakha	24 to 25 Oct. 2019	Tshering Yangchen
7	Training Workshop on SOPs on Veterinary clinical services in Western region	Phuntsholing	12 to 15 Nov 2019	Dr. Jambay Dorji Dr. Nima Wangdi
8	Antimicrobial Usage and Anti-microbial resistance workshop - OIE	Thimphu	25 to 27 Dec 2019	Dr. Pema Tshewang Dr. Jambay Dorji
9	Workshop on Sensitization on AMR - Fleming Fund Project	RTC, Thimphu	3rd Jan 2020	Dr. Kinlay Dorji Dr. Pema Tshewang
10	Microbiology training	Serbithang, NCAH	6 to 10 Jan 2020	Punya Mata Sanyasi
11	Animal Health Coordination Workshop	Gelephu	7 to 12 Jan 2020	Dr. Jambay Dorji Tshering Yangchen
12	AH & National Dog Population Management (DPM) Workshop	Gelephu	8 to 12 Jan 2020	Dr. Nima Wangdi Dr. Meena Devi Samal
13	National Highland Development Program Workshop	Gelephu	13 to 15 Jan 2020	Dr. Nima Wangdi
14	Workshop to develop laboratory SOPs	Phuntsholing	13 to 20 Jan 2020	Dr. Pema Tshewang
15	Meeting on the revision of the medicines Act of the Kingdom	Paro	14 to 16 Jan 2020	Dr. Jambay Dorji
16	Consultation meeting on the revision of the Product Registration Guideline 2013	Paro	24th Jan 2020	Dr. Pema Tshewang
17	CNVR protocol training	Phuntsholing	3 to 7 Feb 2020	Dr. Meena Devi Samal
18	Training Workshop on strengthening the regulation of vaccines	Punakha	11 to 14 Feb 2020	Dr. Meena Devi Samal
19	Training on Standard Operating Procedures (SOPs)	DVH, Thimphu	13 to 14 Feb 2020	Phuntsho Dema
20	Animal Disease control and planning	Lobesa	14th Jun 2020	Dr. Jambay Dorji

EX-COUNTRY MEETINGS/ WORKSHOPS

Table 26: Training/ Workshops attended by NVH staff (ex -country)

Sl. No.	Name of Workshop/Training/meeting	Venue	Date	Staff attended
1.	Regional Workshop for OIE focal points for Animal Welfare in the region of Asia	Bali, Indonesia	11 to 14 Nov 2019	Dr. Pema Tshewang
2.	Antimicrobials training	Australia	8 to 29 Feb 2020	Dr. Pema Tshewang

INTERNSHIPS

NVH serves as a perfect platform to develop the necessary knowledge and skills for the aspiring veterinarians and para-veterinarians who are newly graduated. It eases the transition from being a student to entering the workforce with self-confidence. Twenty students from CNR (9 in 2019 and 11 in 2020) did their internships/ traineeship/ volunteering at NVH over the course of 2019-20 (table 27). Since the CNR institute was closed due to the COVID19, the students made the most of their free time by undergoing training and learning basic skills on veterinary clinical services at NVH ranging from one to two months.

Table 27: Details of interns attached at NVH in 2019-20

Sl. No.	Name	Course	Date
1.	Tshering Pem	B.Sc Animal Science	8/7/19 to 19/7/2019
2.	Tenzin Pelmo		
3.	Tashi Yangzom		
4.	Tshering Dema		2/9/2019
5.	Thinley Namgay		
6.	Neten Dorji		
7.	Pema Choki		9/9/19 to 30/9/2019
8.	Tsheltrim Dorji	Diploma graduates	1/9/19 to 30/9/19
9.	Ugyen Wangchuk		
10.	Sangay Tenzin		
11.	Kiran Gurung		
12.	Tshering Pem	B.Sc Animal Science (4th year)	6/12/19 to 5/1/2020
13.	Tashi Yangzom		
14.	Sangay Choden		4/5/2020 to 27/6/2020
15.	Ugyen Dorji		
16.	Indra Maya Pulami		27/5/2020 to 27/6/2020
17.	Sabina Gurung		
18.	Phub Dem	B.Sc Animal Science (2nd Year)	27/4/2020 to 27/6/20
19.	Sonam Dargay		
20.	Tshering Phuntsho		

CNR diploma/ BSs student internees at NVH

MISCELLANEOUS

HOSTING (VARIOUS MEETING HOSTED BY NVH

Ever since the conference hall at the new hospital in Motithang was furnished, several meetings are being held. In 2019-20 following meetings were organized/ conducted at the conference hall:

Table 28: details of the meetings conducted at the NVH conference hall

Sl. No	Events
1.	2018-19 APA review and 2019-20 APA signing for various agencies under DoL
2.	Antimicrobial awareness week sensitization workshop organized by DoL in collaboration with MoH
3.	AH coordination meeting conducted by AHD, DoL
4.	Debriefing for AH workshop advisory and core group by DPM project

VISITORS TO NVH DURING 2019-20

NVH had following visitors in 2019-20. There were two foreign visitors to NVH: a representative to Government of India who had come to inspect the GOI project sites in the country and a group of delegates from Kasetsart university, Bangkok who had arrived upon the Royal invitation (table 29). The delegates visited NVH to discuss on the prospect of collaboration between the Kasetsart university and NVH/ DoL on the areas of technical assistance with regards to human resource development through short as well as long term studies/ trainings in Bangkok.

Table 29: Summary of visitors received at NVH during 2018-19

Sl. No	Visitors	Remarks
1	Representative of the GOI	Inspection of GOI project activities/ sites
2	Vice president and Deans of Kasetsart university, Bangkok	Through HM's Royal Project

GOI representative visit to NVH

VP and Deans of Kasetsart university, Bangkok

DONATIONS

Several animal lover clients visit NVH and donate items which can be used for the animals and the hospital. We have had such kind people, notably Aum Sonam Lham and Aum Dorji Ohm, who have donated to the hospital from time to time. In 2019-20, we were able to procure two oxygen concentrator with the help of Aum Sonam Lham. Aum Dorji Ohm also donated an oxygen concentrator the previous year and she donated a washing machine with dryer for the hospital this year (table 30). There have also been several clients who made donations either in terms of foods/ snacks/ consumables for the staff from time to time but whose names are not reflected as records were not maintained. It's a sense of great encouragement when we have people working together with us for a common goal and appreciate the words and efforts that we put in day in and day out.

Table 30: Donations received by NVH in 2019-20

Sl. No	Particulars	Donated by
1	2 Oxygen concentrator	Aum Sonam Lham
2	Washing machine with dryer	Aum Dorji Ohm, YDF
3	Hand sanitizers/ E-collars	Miss Mui- Junction Book Store
4	Thermometers & Hair clipper	Mr. Tenzin Rabgay

E-Collars and consumables

Thermometer

Hair clipper

Washing machine with dryer

JOB RESPONSIBILITIES/ FOCAL PERSONS

For the smooth operations of various activities and efficient provision of services, focal persons are identified and appointed to take care of specific activities/ services at NVH (table 31). By assigning job responsibilities and appointing focal persons, the efficiency of services is not only enhanced but the accountability, either during success or failure can easily be linked to an individual or a team. It also provides a sense of ownership to the individuals and thereby improve the overall performances. The responsibilities are rotated annually so that everybody gets equal opportunity to experience as well as contribute in their own ways. The section incharges/ Head for various sections/ units in 2019-20 are given in the table below.

Table 31: Identified Focal persons for various units/ services at NVH

Sl. No	Name	Focal/ Job Responsibilities
1.	Dr. Kinley Dorji	Overall Management Mobile Veterinary Clinic
2.	Dr. Pema Tshewang	Out Patient Unit Animal welfare Cost Sharing Scheme
3.	Dr. Jambay Dorji	In- Patient unit SOPs Medicine
4.	Dr. Meena Devi Samal	Surgical section Pharmacovigilance
5.	Dr. Nima Wangdi	Diagnostics unit (clinical & lab) EVDP
6.	Tshering Yangchen	Endoscopy/ Ultrasonography section Pharmacovigilance
7.	Sonam Zangmo	Minor OT section
8.	Gembo Tshering	Emergency section Mobile Highland program
9.	Leela Maya Dahal	Medicine and Store section
10.	Phuntsho Dema	Vaccination section
11.	Chimi Wangmo	Surgery section
12.	Tsheltrim Wangmo	Treatment section
13.	Neten Zangmo	Physiotherapy section
14.	Nidup Dorji	In-patient ward section
15.	Kinzang Pelden	Laboratory section
16.	Pema Tshomo	
17.	Punya Mata Sanyasi	
18.	Tula Maya Sharma	Administrative section
19.	Ludup Pelmo	Data Management (VIS/ Pet registration) Reception

MEMBERSHIPS

Most of the veterinarians of NVH are members to important offices which require collaborative and technical support from NVH. Current memberships of NVH to various offices are as given in the table 32 below:

Table 32: Memberships of NVH Veterinary Officers to other offices

Sl. No	Memberships	Focal members
1	Country focal points for Animal welfare to OIE	Dr. Kinley Dorji Dr. Pema Tshewang
2	Drug Technical Advisory Committee (DTAC) member	Dr. Jambay Dorji
3	Evaluation committee member for Dossier evaluation of veterinary medicines with DRA	Dr. Pema Tshewang
4	National Veterinary Drug Committee (Evaluation committee member)	Dr. Nima Wangdi
5	National Veterinary Drug Committee (Awarding committee member)	Dr. Kinley Dorji
6	Focal for Pharmacovigilance	Dr. Meena Devi Tshering Yangchen

7. CASE STUDIES

Eye Ball Removal (Enucleation) in a pet dog

Nima Wangdi[1]

[1]*Senior Veterinary Officer, National Veterinary Hospital, Motithang*

Background

Enucleation is the surgical removal of an eye and its associated structures such as nictitating membrane, eyelids, conjunctiva and tear glands depending on the technique. In almost all cases, the eye is removed because it has reached a point where it has no chance of being capable of sight and it is painful. Traumatic injuries to the eye (such as an infected scratch, puncture, and sharp injury), tumors, glaucoma and ulcers on the eye are catastrophes. Any of these conditions creates a painful, blinded eye.

Brachycephalic breeds, those with a flattened faces and prominent eyes such as Pug, Shih Tzu, Damtsi, French bull dog etc. tend to be predisposed to eye injuries. The primary focus of enucleation must become the relief of pain when restoring vision becomes hopeless.

The procedure is carried out under full general anesthetic and, although a major procedure, there is every chance of a successful outcome. This is not a specialist procedure and it is commonly carried out at general veterinary practice.

Efficacy of Enucleation in dogs

Once the initial post-operative discomfort such as inflammatory swelling, seepage of serum through the incision etc. is over, enucleation is extremely effective at preventing ocular pain, without risk of relapse. Post- surgery follow-up interview with the client found out that his pet is happier than it has been some time, as the long-term pain has gone. Medical management of long-term severe eye condition is rarely successful, which leaves the possibility that the dog is in constant low-grade pain, so the treatment decisions are best made with the dogs' long-term welfare in mind.

Enucleation Recovery in Dogs

It is always important and essential the dog wears an E-collar (Elizabethan collar) until the sutures are removed at the end of 10-14 days post-surgery. For the first two to three days postoperatively, the dog may show some discomforts. The pain can easily be managed with post-operative medications.

Complications are rare, but may include hemorrhage or wound gaping (Wound breakdown) through scratching if the owner fails to take care of the dog. However, the majority of the patients make a full and uneventful recovery at the 10-14 day. Once the sutures are removed no further aftercare is needed.

Considerations

There are many factors to consider with enucleation surgery. The procedure is permanent and irreversible, and the dog blind on that side afterwards. The short-term discomfort of surgery is balanced against the long-term benefit of being pain free. The risk of surgery is low and relate to hemorrhage and any anesthetic risks for that individual patient. However, good surgical technique and pre-operative screening minimizes both of these factors.

Case Observation

- ✓ Active with slightly staggering gait
- ✓ Exophthalmia (Left eyeball)
- ✓ Corneal ulceration with opacity
- ✓ Septic infection
- ✓ No vision of the affected eye
- ✓ Edema of the affected eye ball

The dog incurred a blunt trauma on the head, causing the left eyeball to eviscerate from the socket. There was focal ulceration of the affected eyeball with corneal opacity due to self-mutilation through scratching. As a result of those combining factors, the dog lost his eye sight.
The decision for enucleation was made based on the following reasons:

- ✓ Permanent loss of vision
- ✓ Uncontrollable pain
- ✓ Medical management was impossible

The patient was given with Inj. Gentamicin@6mg/kg (6kgs) as pre-operative medication for 3 days combined with antiseptic dressing of the affected eye to reduce the infection and swelling.

Anesthetic induction

1. Inj. Xylazine 0.6 ml I/M
2. Inj. Ketamine 1.0 ml I/M
3. Inj. Meloxicam 0.5 ml I/M
4. Inj. Gentamicin 0.4ml I/M

- For the better pain control, retrobulbar nerve was blocked using 2% lignocaine hydrochloride @ 1.0 ml.

Patient Preparation and Positioning

After induction and maintenance general anesthesia, the patient's upper eyelashes were trimmed using scissors. The periocular skin was prepared aseptically using chlorhexidine solution (0.2 %) followed by povidone iodine solution, while the conjunctival fornix and the corneal surface were cleaned with normal saline for three times.
Optimal head positioning was achieved by placing the patient on right lateral recumbency and lifting the head by using soft cushion under the head to flex the patient's head.

Fig. 1 Aseptic preparation

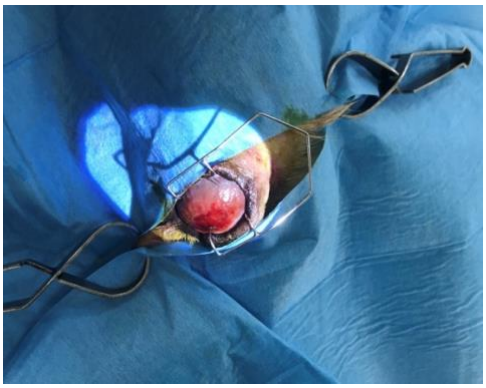


Fig. 2 Position on the OT table

Surgical Approach and Procedure

There are two approaches for enucleation surgery:

1. Trans-conjunctival or *Subconjunctival*
2. Trans-palpebral

The trans conjunctival approach involves an initial incision around the bulbar conjunctiva and has the advantages of reduced orbital tissue loss and subsequent orbital sinking, less hemorrhage and less time consuming. This approach should not be used in a patient with a suspected or known intraocular infection.

The trans palpebral approach is recommended for any indication when removing an eye. With this approach, an elliptical incision is made around the eyelids, and the globe and all secretory tissues (eyelids, and conjunctiva, nictitating membrane) are removed within the conjunctival sac.

Trans-conjunctival Approach

- ✓ Lateral canthotomy was performed and the eyelid was excised 5 mm posterior to the mucocutaneous junction in a single continuous fashion with Mayo scissors.
- ✓ The nictitating membrane was excised at its base with Mayos scissor.
- ✓ The bulbar conjunctiva was incised 3-5 mm posterior to the limbus and the extraocular muscles were transected near their scleral attachment.
- ✓ The retractor bulbi muscle fibers and optic nerve were severed with curved enucleation scissor and the remaining conjunctiva was excised.
- ✓ A ligature was placed around the optic nerve and the associated posterior ciliary vessels before excising the globe.
- ✓ The conjunctiva and the subcutaneous tissues were closed with vicryl 5-0, absorbable, polyfilament suture material in a simple continuous fashion.
- ✓ Finally, both the eyelids were excised using a Mayos scissors and the eyelids were closed with non-absorbable nylon suture material 2-0 in an interrupted fashion.

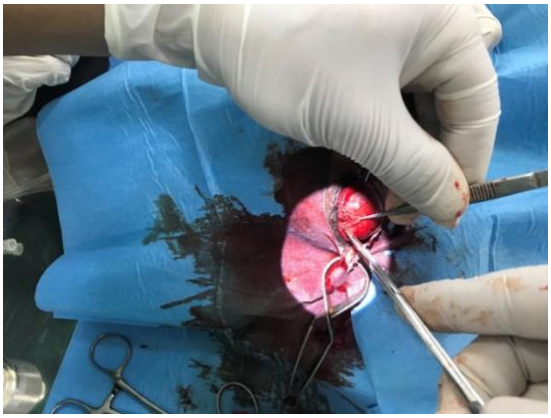


Fig. 3 Incision on bulbar conjunctiva

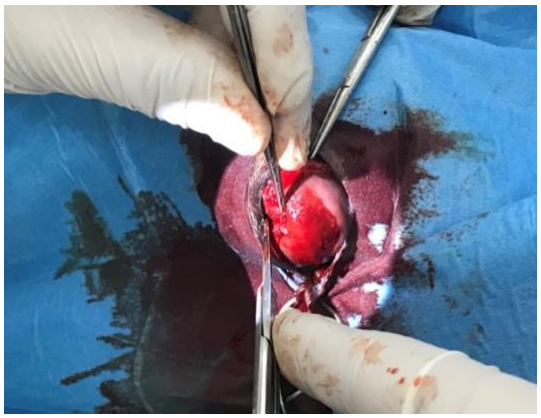


Fig. 4 Separation extraocular muscles

Post-operative Care

The patient was discharged at the same day after giving anti-inflammatory and analgesic medication i.e. Meloxicam @ 0.4 mg/ kg IM for 3 days and follow up antibiotic BID for 5 days. The client was advised to apply an Elizabethan collar until suture removal to prevent self-trauma. The suture wound had healed completely and removed in ten days.

Surgical treatment of a mandibular fracture in a bull using continuous wire-loop technique

Jambay Dorji[1] and Tshering Yangchen[1]

[1]National Veterinary Hospital, Department of Livestock

Introduction

Mandibular fractures occur due to direct trauma or during dystocia when fetus is removed forcefully by traction. It is the most common fractures of the cranium in cattle (Elma 1988). Mandibular fractures usually occur in a unilateral form, but can also occur bilaterally. Fractures may occur in the symphysis, corpus and ramus of the mandible, and in the processus condylaris, which forms the temporomandibular joint (Dirksen 1978; Turner 1984; Fessler and Adams 1996). The fracture can be either open or closed.

The main goal of surgical treatment of mandibular fractures is to achieve adequate temporary stabilization of the main fragments to allow pain-free mastication and rumination until sufficient callus is present to stabilize the fracture (Turner 1984). There are different techniques used to repair symphysis mandibular fractures which include external fixators, using either Steinmann pins or clamps, internal fixation, using screws administered in lag fashion and use of cerclage wires (Nuss et al. 1991; Lischer et al. 1997; Johnson and Hulse 2002; Ducharme 2004; Harasen 2008; Middha et al. 2015).

This case report describes surgical treatment of mandibular fracture using a continuous wire-loop technique.

Anamnesis,

An adult bull of local breed was hit by a moving truck in the night along the Damchu highway. The bull was rescued by Jangsa Animal Saving Trust (JAST) and taken to the shelter at Serbithang. The case was referred to NVH for treatment.

Observation and Diagnosis

The bull had sustained injuries on the head and limbs. The bull was unable to drink or feed. There was bleeding from the mouth and nostrils and swelling on the right side of the face. Several wounds on the body (muzzle, face, shoulder and back) were also observed. Upon palpation of the right forelimb, fracture of metacarpal bone was felt. Examination of oral cavity revealed tear on the gingiva and fracture of mandible. The fractures were also confirmed by radiography. The bull was recumbent the prognosis was fair.

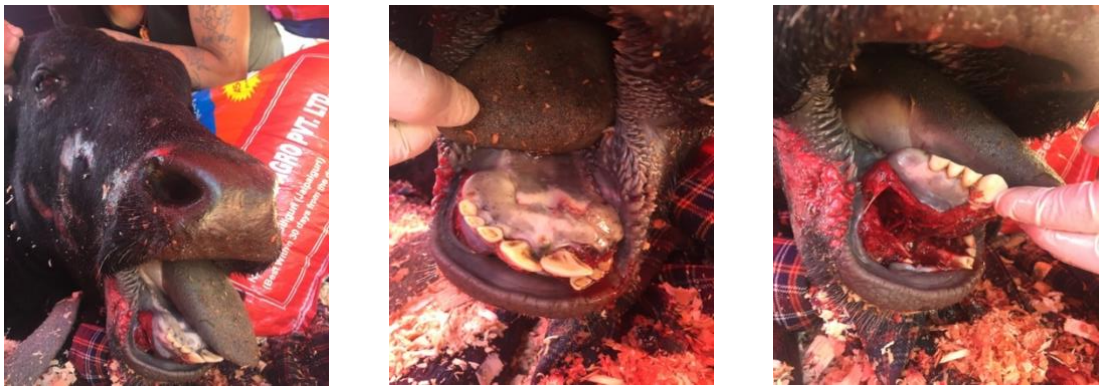


Figure 1: Mandibular fracture with tear of ginigiva

Surgical management

The animal was sedated using Xylazine @ 0.05mg/kg intravenously which was followed by Ketamine @ 2mg/kg intravenously. The oral cavity was flushed using normal saline and subsequently with potassium permanganate solution. The wound on the gingiva was sutured using Vicryl 2 (Polyglactin 910).

The fracture was fixed externally with a wire placed around the base of the incisors, using the interdental continuous wire-loop technique described by Obwegeser (1952). Wire loops were inserted between the bases of each tooth from the lingual to the labial side. The long end of the wire was then inserted through each loop on the labial side. Finally, the wire ends and each loop were gently tightened until fracture fragments were stabilized. The lower jaw was further immobilized by placing wire on the body of the mandible in a criss-cross fashion and tightened below the chin. The copper wife of 2mm diameter was used for this purpose.

The fractured bone (right forelimb) was brought to alignment with traction and counter traction, and immobilized using fiberglass plaster.

The animal was treated with antibiotic (Ampicillin-cloxacillin @ 10mg/kg IM, analgesic (Meloxicam @ 0.2mg/kg IM), B complex @ 10 ml IM and fluid therapy.

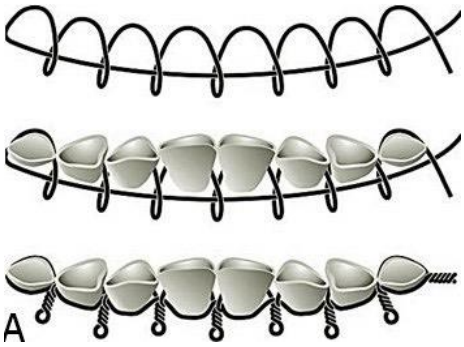


Figure 2: Interdental continuous wire-loop technique (Rasekh et al. 2011)

Figure 3: Postoperative view

Discussion and Conclusion

Rostral mandibular fractures usually heal without complication in 4 to 6 weeks, provided there is adequate stabilization and permanent tooth buds are not involved. Fractures involving the interdental space may require a longer healing period, typically 8 weeks (Wilson 2011). The wires can be removed after six to eight weeks. The most common postoperative complications reported are implant loosening, osteomyelitis, sequestration and tooth abscess and gingivitis (Turner 1984; Fessler and Adams 1996; Ducharme 2004; Rasekh et al. 2011). In our case, the complications and healing process could not be observed since the bull succumbed to the injuries. Some of the constraints during the operation were unavailability of suture wires or external fixators, wire cutters and drill machine. Due to lack of gaseous anesthesia, maintaining the anesthesia with combination of Xylazine and Ketamine was challenging and also the life of the animal was posed to risk given the narrow margin of safety with Xylazine in bovines.

Over the years, there has been an increase in the number of animals injured by automobile accidents in the city as well as along the highways. In 2016, there was a report of fatality in wild animals along the Thimphu-Phuntsholing highway due to run over by vehicles (The Bhutanese 2016). This could be attributed to increase in the number of vehicles, speeding of vehicles on the highway, animals send for grazing along the highway and also because some animals are fond of resting in the middle of the roads. The animals injured are mostly bulls or dry cows, which are usually left free by the farmers as they are of no use to them.

In order to avert automobile accident injuries to animals, it is important for the animal welfare organizations such as JAST, RSPCA etc. to create awareness and educate the drivers on safe driving, place sign boards along the high way to reduce speeding when and discouraging farmers to let the animals along the road. The commuters should also inform the animal welfare organization if they accidently hit animals or if they come across any injured animals on the

highway so that the animal receive veterinary services on time thereby saving the lives of the animal and promoting animal welfare.

To conclude, that the continuous wire-loop technique can be adopted to surgically manage mandibular fracture in animals as the technique can be easily applied, there is no requirement of special equipment and it is very effective in stabilizing the fractured ends.

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Chronic Kidney Failure in a dog

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Introduction

Chronic kidney disease (CKD) is an irreversible and progressive deterioration of renal function, resulting from a decreased number of functional nephrons. Unfortunately, the compensatory mechanisms that respond to nephron loss (glomerular hypertension, hyperfiltration) help facilitate progression of CKD, potentially contributing to it more so than the original injury (JD Foster, 2015). As per Polzin, 1995 the case of chronic renal failure (CRF) occurs in every dog and cat breed at any age, but the older animals are more frequently affected than younger ones. However, congenital renal diseases, including dysplasia and various glomerulopathies, may produce CKD at very early ages. Once diagnosed, CKD typically remains a life-long condition. The average age of animals with CRF is approximately seven years and their life expectancy is still poor yet with the sufficient time and care given with improved knowledge and treatment modalities of CRF, the quality of life may gain (Hein P. 2004).

Presentation

A 10-year-old male Shih Tzu was presented with a history of anorexia, lethargy, weight loss, polydipsia and vomiting for several days. The dog was alert with body temperature of 100.9^{o}F. Blood and urine samples were collected for serum biochemistry, CBC and urinalysis. Digital x-rays of the abdomen were taken.

Laboratory findings

Urinalysis

From the urinalysis, large quantities of protein excreted in the urine were observed and the quantity of protein in urine increased as days passed by (Table 1).

Table 1: Test result from Urinalysis

Type of test	7	9	11	17	24	29	52	59	107 (Days)
Protein (PRO)(g/L)	1	1	1	1	>=3	>=3	>=3	>=3	>=3

Serum Biochemistry

Results of serum biochemistry showed increased level of phosphorus (19.6 mg/dl), BUN (155 mg/dl) and creatinine (8.9 mg/dl) in the blood.

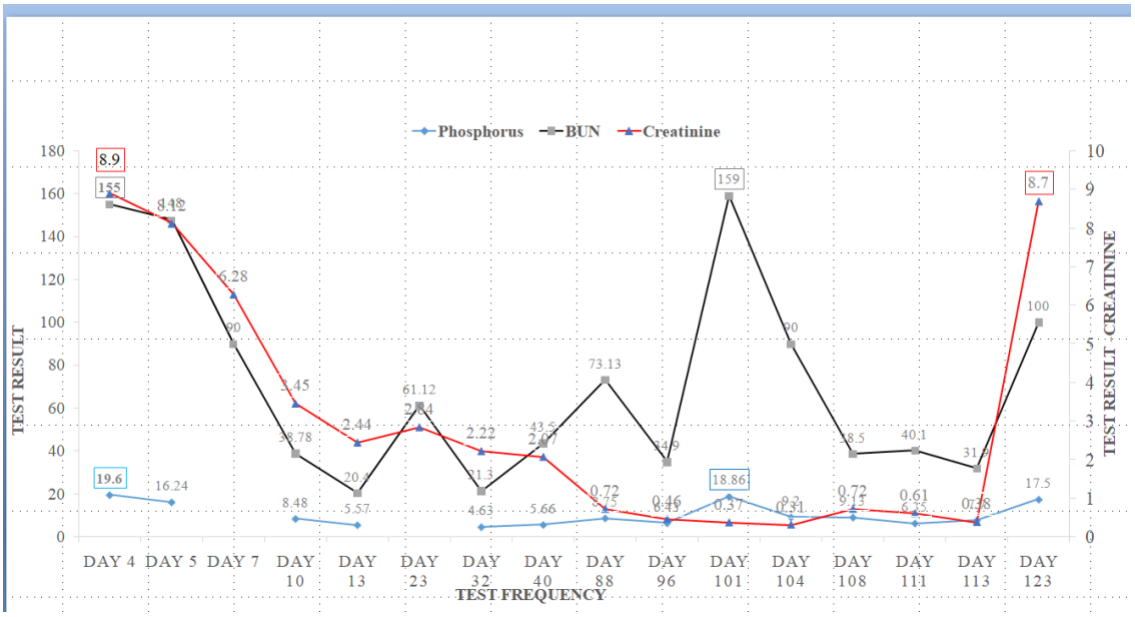

Figure1: Biochemistry test result

Hematology

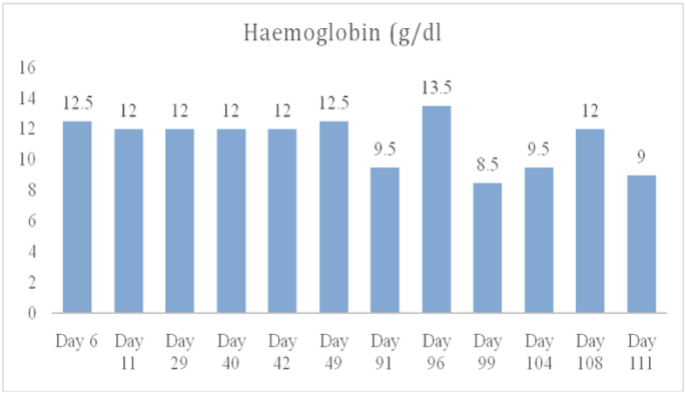

Figure 2: level of Hemoglobin on different days

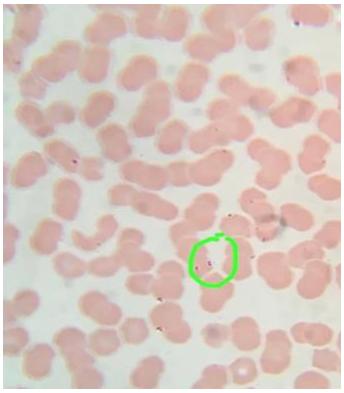

Fig. 3: Anaplasma on Blood smear

The hemoglobin levels were mildly low but constant till day 41 of the disease. It dropped down on day 91, climbed up on 96th day and again dropped between 8.5 and 9.5 on 99th and 104th day. It again fluctuated to 12 and 9mg/dl on 108th and 111th day respectively.

The blood sample was also positive for a hemoprotozoan, Anasplasma marginale.

On day 18, the BP was 168/111 (131) and with the medication, the BP level was controlled. However, from day 106th onwards it was difficult to control the BP level as shown in figure 4.

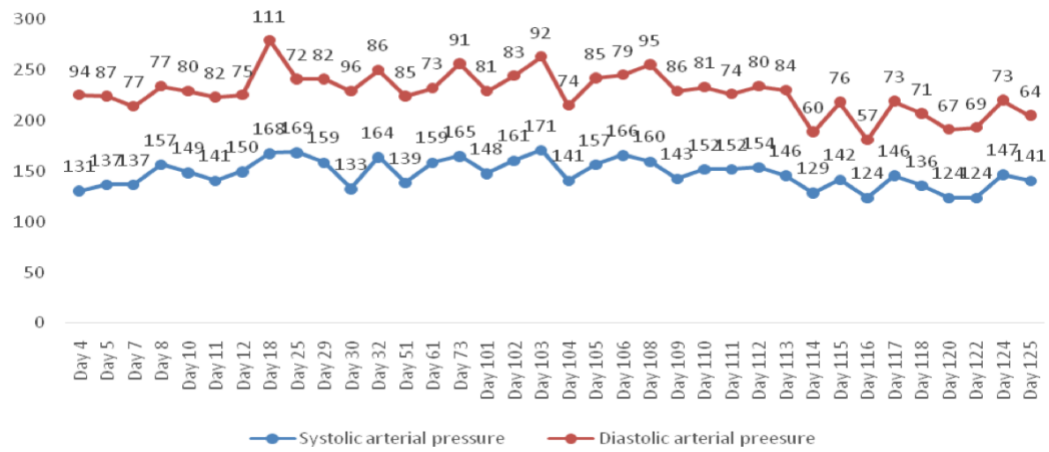

Figure 4: monitoring of blood pressure in the patient

Radiography

Besides above laboratory analysis, the x-rays of abdomen were taken to rule out the presence of foreign bodies in the GI tract. The radiography images revealed mild splenomegaly and hepatomegaly.

Diagnosis

Based on the history, clinical sign and laboratory results, the patient was confirmed to be suffering from dog "stage 4 Chronic Kidney Disease". This is as per **International Renal Interest Society (IRIS**) based on the creatinine concentrations.

Treatment

Prior to the laboratory confirmation, the dog was treated symptomatically as described in table 2. The treatment was provided twice daily for seven days with subsequent recording of vital parameters.

Table 2: Line of treatment

Medicine used	Dosage
Inj. Normal saline (NS)	100ml/ hr IV
Inj. Metoclopramide	0.2mg/ kg bw
Inj. Pantoprazole	1mg/ kg bw IV
Inj. B'complex	0.5ml IV
Inj. Frusemide	2mg/kg bw IV

Tablet Doxycycline (50 mg) – 1$_{1/2}$ tab twice daily for 30 days was advised to treat Anaplasmosis.

On day 18, the BP was 168/111 (131) and urine showed presence of protein (>=3.0 g/L). Therefore, in addition to normal medications, the following drugs were given to control BP and correct proteinuria.

- *Tab Enalapril (5mg) – ½ tab daily*
- *Cap Fish Oil – 1 cap daily.*

Since the BP was not controlled with Enalapril, Amlodipine (5mg) – ½ tab once daily and increased dose of Enalapril (10mg) tab were given from day 107th onwards. As Hb level is below normal, syrup aRBC pet (haematinic) – 2 ml twice daily was given.

At regular intervals, the levels of BUN, Creatinine and phosphorus were monitored and as and when level rises, fluid therapy was given along with diuretics. Since Hb level was low, syrup aRBC pet (haematinic) was continuously given.

Nutritional Management

The patient was advised to be fed on Renal Diet (Vet-Pro by Drools). The diet provides a reduced level of high quality protein, phosphorus and sodium and increased B vitamins, soluble fibers, polyunsaturated fatty acid, antioxidants to help the patient to meet nutritional requirement and at the subsequently reduce the workload for kidney by avoiding excessive nitrogenous waste. Further the dog was given Phosphate binder @ 1.25 gm orally twice a day. The compromised kidneys cannot remove phosphorus from the bloodstream efficiently and it can start pulling calcium out from the bones making the bones weaker. Chemicals content such as lactose, calcium carbonate and chitosan in the phosphate binder helps to maintain bone strength of the patient.

Tablet Rubenal -300 @ 1/2 tab twice daily and capsule fish oil @ one capsule twice daily were given as complementary feeding. In addition to the renal diet, the dog was advised to be fed plenty of fresh water to prevent dehydration.

Result

On day 118, there was complete failure of both the kidneys and the urine output was absent.

As a result of complete kidney failure, fluid started accumulating in limbs. Hence, fluid therapy was also stopped and only oral medications were given. The dog succumbed to the disease and died on the 127th day.

Conclusion

The above is a typical case of Chronic Kidney failure. The serum biochemistry profile showed high levels of nitrogen based substances (urea, creatinine) leading to azotemia. Throughout the investigation and treatment period, the dog was showing low haemoglobin level in the blood. Erythropoietin is a hormone produced by the kidneys that regulates red blood cell production by the bone marrow. Inadequate production of erythropoietin by the diseased kidneys leads to anemia.

The presence of protein in urine is suggestive of kidney damage. Towards the latter part of treatment, the level of proteinuria was consistently >=3.0g/L even though the patient was put on antihypertensive drugs.

Systemic hypertension was observed in this case. ACE inhibitor (Enalapril) alone was not able normalize the BP but when combined with Calcium Channel Blocker (Amlodipine) the BP was under control.

Gastroenteritis with GI hemorrhage was also evident in this case. The condition is due to bleeding caused by platelet dysfunction, ammonia production from urea by bacteria in GI tract. Vomiting is common in such cases.

Treatment of renal diseases is challenging especially in senior patients. Along with medication, strict diet control plays a very important role. Unlike humans, where dialysis facilities are available to prolong their lives, animals do not have that privileges. The prognosis for such cases is unfavourable.

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8. Annexure

1. Annual Performance Agreement of NVH 2019-20

DOL

PERFORMANCE AGREEMENT
BETWEEN
Chief, Animal Health Division
And
Chief Veterinary Officer, National Veterinary Hospital
DEPARTMENT OF LIVESTOCK
MINISTRY OF AGRICULTURE AND FORESTS
(1st July 2019 – 30th June 2020)

Section 2: Objective, Outputs, Success indicators and Target (NVH FY 2019-20)

Action	Success indicator	Unit (earlier than wt.)	Targets / Criteria Value					Achievement
			Excellent (100%)	Very Good (90%)	Good (80%)	Fair (70%)	Poor (60%)	
Enhance Client satisfaction Rate	Client Satisfaction Rate	Percent	>86	86-80	79-75	74-70	<70	*86.4%*
Provide veterinary clinical services to the clients	Treatment and surgical interventions in animals	Nos.	>15000	15000-14000	13999-12000	11999-10000	<10000	*20684 cases treated*
	Procurement of advanced diagnostic equipment (X-ray, ultrasound, gaseous anesthetic machine)	Timeline	Mar 2020	Apr 2020	May 2020	June 2020	July 2020	*Procured X-ray, ultrasound, endoscopy and gaseous anesthetic machines*
SOPs for veterinary clinical services in veterinary hospitals	Training of field staff on SOPs of veterinary clinical services in collaboration with	Stage	Two batches trained	One batch trained	Training module finalizd	Training modules drafted	Not initiatd	*2 batches trained:* *i. DVHs/ LECs under RLDC Tsimasham and*

promoted	RLDC							*ii. LECs of Tphu Dzongkhag*
Mobile veterinary clinic services for highlanders provided	Mobile Veterinary clinical services in highland area	Nos.	3	2	1	0	0	*Visited 2 areas (Laya and Soe) – 3rd visit suspended due to COVID19*
Pharmaco-vigilance activities Promoted	Monitoring of pharmaco-vigilance activities	Nos.	4	3	2	1	0	*Suspended activity due to COVID19*
	Revise and develop ADR/AEFV guidelines	Stage	Guide-lines endorsd	Guide-lines finalized	Guide-lines devlped	Draft guide-lines prepare d	Draft guide-lines not prepare d	*Presented to 37th DTAC for endorsement*
Responsible pet ownership promoted	Provide Pet Registration at NVH	Nos.	>800	800-799	699-600	599-500	<500	*1630 pets registered*
Prevent outbreak of rabies	Vaccination of dogs and cats (Anti-Rabies & DHPPi + L)	Nos.	>1800	1800-1500	1499-1000	999-500	<500	*5022 of dogs and cats vaccinated with ARV and DHPPi+ L*
Sustainable management of dog population conducted	Scheduled sterilization of pet animals at NVH	Nos.	>500	500-400	399-300	299-200	<200	*773 number of animals sterilized at NVH*
	Collaborative mass sterilization of dogs	Nos.	>1000	1000-800	799-700	699-600	<600	*Collaborative program with DPM at Haa and Tphu (total no. 1733)*
Animal welfare promoted	Bhutan animal welfare standards and guidelines endorsed by GNHC	Timeli ne	Jan 2020	Feb 2020	Mar 2020	Apr 2020	May 2020	*Presented at 106th and represented and Endorsed at 108th GNHC (Dec 15th 2019)*
Veterinary laboratory diagnostic capacity enhanced	Establishment of microbiology lab	Stage	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	*Procured some microbiology equipment. Couldn't procure all the lab equipment due to COVID19.*
	Collect and examine Laboratory samples	Nos.	>700	700-600	599-500	499-400	<400	*697 samples collected and 2,306 tests performed*
Cost recovery scheme for veterinary clinical services initiated	Get approval from department for initiation/ implementation of CRS at NVH	Timeli ne	Jan 2020	Feb 2020	Mar 2020	Apr 2020	May 2020	*Presented to 112th GNHC on 24th June 2020. Meeting was delayed due to COVID19.*
Meetings and workshop conducted	Staff coordination meeting at NVH	Nos.	4	3	2	1	0	*5 meetings were conducted.*
Veterinary Information System (VIS) fully utilized	Update veterinary Clinical services information in VIS routinely	Percent	100%	98-100%	95-97%	92-94%	<92%	*100 % updated.*

Annual reports prepared	Develop and submit Annual progress report to the Dept	Timeline	30th July	7th Aug	14th Aug	21st Aug	30th Aug	*Developed.*
Budget utilization efficiency enhanced	Percentage of approved budget utilized	Percent	100-98%	97-96 %	95-94 %	93-92 %	<92 %	*97.6 % utilized*
Asset declaration completed	Asset declaration by all staff	Percent	100%	95-99 %	90-94 %	85-89 %	<85 %	*Asset by all staff declared*
Dzongkha used as part of official correspondences	Include Dzongkha language for official correspondences	Nos.	>30	30-25	24-20	19-15	<15	*30 office orders issued in dzongkhag)*

2. Budget details for 2019-20

Expenditure Statement
For A/C No. 204: 204,01/1003 - LC
Program Code: 045- NAH, Livestock Service
Fiscal Year 2019-2020
(Nu in Millions)

OBJECT CODE	TITTLE	APPROPRIATIONS			Expenditure amount	Balance	Utilization %
		CURRENT	CAPITAL	TOTAL			
001.01	RGOB Financing					Nu.	
1.01	Pay and Allowances	8.290		8.290	8.290	0.000	100.0
2.01	Other Personnel Emoluments	0.829		0.829	0.828	0.001	99.9
24.03	Contributions - Provident Fund	1.158		1.158	1.157	0.001	99.9
	Total	**10.277**		**10.277**	**10.275**	**0.002**	**100.0**
001.02	**Operation and Management Services RGOB Financing**						
11.01	Travel - Incountry	1.629		1.629	1.623	0.006	99.6
12.01	Utilities - Telephones, Telex, Fax, E-mail, Internet	0.081		0.081	0.080	0.001	98.8
12.02	Utilities - Telegram, Wireless Transmission, Postage	0.020		0.020	0.005	0.015	25.0
12.03	Utilities - Electricity, Water, Sewage	0.213		0.213	0.212	0.001	99.5
14.01	S & M - Office Supplies, Printing, Publications	0.196		0.196	0.193	0.003	98.5
14.02	S & M - Medicines & Laboratory Consumables	0.366		0.366	0.366	0	100.0
14.05	S & M - Animal feeds	0.115		0.115	0.113	0.002	98.3
14.06	S & M - Uniforms, Extension Kits, Linens	0.092		0.092	0.092	0	100.0
15.01	Maintenance of Property - Buildings	0.320		0.320	0.319	0.001	99.7
15.02	Maintenance of Property - Vehicle	0.465		0.465	0.465	0	100.0
15.05	Maintenance of Property - Equipments	0.030		0.030	0.017	0.013	56.7
15.07	Maintenance of Property - Computers	0.020		0.020	0.020	0	100.0
17.01	Op Exp. - Advertising	0.015		0.015	0.011	0.004	73.3
17.02	Op. Exp. - Taxes, Duties, Royalties, Handling Charges, Bank Charges	0.015		0.015	0.015	0	100.0
18.01	Hospital & Entertainment	0.030		0.030	0.030	0	100.0
25.01	Retirement Benefits	1.846		1.846	1.843	0.003	99.8

	TOTAL FINANCING ITEM CODE 0001	**5.453**		**5.453**	**5.404**	**0.049**	99.1
	TOTAL SUB-ACTIVITY 001.02	**5.453**		**5.453**	**5.404**	**0.049**	99.1
001.04	**ANIMAL HEALTH - DOG & CAT POPULATION MANAGEMENT & RABIES CONTROL PROGRAM**						
	RGOB Financing						
11.01	Travel - Incountry	0.019		0.019	0.019	0.000	100.0
14.02	S & M - Medicines & Laboratory Consumables	0.030		0.030	0.029	0.001	96.7
17.08	Op.Exp.- Incountry Meeting and Celebration	0.013		0.013	0.012	0.001	92.3
	TOTAL FINANCING ITEM CODE 0001	**0.062**		**0.062**	0.060	**0.002**	96.8
	TOTAL SUB-ACTIVITY 001.04	**0.062**		**0.062**	0.060	**0.002**	96.8
001.05	**NATIONAL PHARMACOVIGILANCE CENTRE FOR VETERINARY**						
	RGOB Financing						
11.01	Travel - Incountry	0.050		0.050	0.029	0.021	58.0
14.01	S & M - Office Supplies, Printing, Publications	0.030		0.030	0.023	0.007	76.7
	TOTAL FINANCING ITEM CODE 0001	**0.080**		**0.080**	**0.052**	**0.028**	65.0
	TOTAL SUB-ACTIVITY 001.05	**0.080**		**0.080**	**0.052**	**0.028**	65.0
001.08	**MOBILE CLINIC FOR MOBILE HIGHLANDERS PROGRAM**						
	RGOB Financing						
11.01	Travel - Incountry	0.100		0.100	0.100	0.000	100.0
14.02	S&M- Medicines & Laboratory Conumables	0.020		0.020	0.020	0.000	100.0
17.08	Op.Exp.- Incountry Meeting and Celebration	0.040		0.040	0.036	0.004	90.0
	TOTAL FINANCING ITEM CODE 0001	**0.160**		**0.160**	0.156	**0.004**	97.5
	TOTAL SUB-ACTIVITY 001.08	**0.160**		**0.160**	**0.156**	**0.004**	97.5

52.07	**PROCUREMENT OF LABORATORY EQUIPMENTS RURAL DEVELOPMENT AND CLIMATE CHANGE RESPONSE PROGRAMME**		2.200	2.200	1.600	0.600	72.7
	TOTAL FINANCING ITEM CODE 4599		**2.200**	**2.200**	1.600	**0.600**	72.7
	TOTAL SUB-ACTIVITY 001.14		**2.200**	**2.200**	**1.600**	**0.600**	72.7
52.07	**PROCUREMENT OF VETERINARY EQUIPMENTS (DIGITAL Z-RAY MACHINE &ACCESSORIES GASEOUS ANESTHETIC MACHINE, ADVANCED IMAGING ULTRASOUND MACHINE AND ENDOSCOPY MACHINE) RGOB Financing**		10.470	10.470	10.464	0.006	99.9
	TOTAL FINANCING ITEM CODE: 0001		**10.470**	**10.470**	**10.464**	**0.006**	99.9
	TOTAL SUB-ACTIVITY 001.15		**10.470**	**10.470**	**10.464**	**0.006**	99.9
	TOTAL FIELC OFFICE 21	**16.032**	**12.670**	**28.702**	**28.011**	**0.691**	**97.6**

Total budget utilization % for 2019-20	**97.60%**

3. Different dog and cat breeds registered in 2019-20

Dog Breed	**Number registered (new only)**	**Cat Breed**	**Number registered (new only)**
Alsatian/Cross	45	Local	381
Apsoo/ Cross	203	Persian/ Cross	13
American Bully	1		
Chihuahua	4		
Cocker Spaniel/ Cross	7		
Dalmatian/ Cross	2		
Damtsi/ Cross	121		
Doberman Pinscher	3		
French Bull Dog	10		
French Mastiff	1		
German Shepherd/ Cross	49		
Golden Retriever/ Cross	11		
Great Dane	1		
Husky Cross	2		
Jobchi/ Cross	180		
Labrador/ Cross	79		
Local/ Cross	294		
Mixed Breed	115		
Pomeranian/ Cross	69		
Pug/ Cross	13		
Rottweiler	1		
Shih Tzu/ Cross	9		
Spitz	7		
St. Bernard	5		
Pekingese	2		
English Bull Dog	2		
Total	1236		394
	1630		

TASHI DELEK PHUENSUM TSHOK!