NATIONAL VETERINARY HOSPITAL

ANNUAL PROGRESS REPORT

2018-19

DEPARTMENT OF LIVESTOCK, MINISTRY OF AGRICULTURE AND FORESTS

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Compiled and Edited by Dr. Pema Tshewang

FOREWORD

Greetings to all the well-wishers and readers! I am very happy to present the second annual progress report of National Veterinary Hospital. It has been another year of fruitful outcome!

NVH has strived to uphold its position and mandates as the Referral center and National Hospital for Veterinary clinical services. There has been tremendous development in terms of infrastructure and facilities over the past couple of years. We have come a long way from providing "traditional symptomatic based treatment" to "laboratory result based interventions". The professional conduct and standardization of services are markedly improved. As the custodian of Veterinary clinical services, NVH is striving hard by all means to not only improve the services provided at National Veterinary Hospital but also the animal health centers across the country.

We are making best use of our available resources and manpower to meet the increasing expectations and demands of the clients who are more educated and aware of their pets'/ animals' health care and needs. Despite numerous challenges and constraints, we have been able to meet the objectives set out year in and year out. This has been possible due to sheer dedication of all the staff towards their profession and the continuous support rendered by the department. I would like to acknowledge the constant guidance and support received from the department under the dynamic leadership of Dasho DG and also thank all the other colleagues working under the department for their continuous support and encouragement.

Our accomplishments are testamount to the hard work and dedication of the staff in serving to the best of their abilities. I take this opportunity to congratulate all the staff for their achievements and wish for similar dedication in all the future endeavors.

Tashi Delek and Happy reading!

(Dr. Kinley Dorji)

EXECUTIVE SUMMARY

For 2018-19, NVH has strived to fulfill its mandates, especially with regards to providing technical backstopping on veterinary clinical services to the animal health centers around the country. NVH has successfully visited all the dzongkhag veterinary hospitals in the country except Trashiyangtse. We also covered 19 Livestock extension centers excluding two highland areas (Laya and Merak). It is expected that the technical monitoring reports from these visits will help to understand the shortcomings inorder make necessary interventions to improve the overall set up and operations of the animal health centers across the country, specifically with regards to veterinary clinical services delivery.

One of the highlights of our achievements in 2018-19 was organizing a Training workshop on Ultrasonography and Radiology for the veterinarians in the country. A total of 23 Veterinarians were trained during the six days' program. After the training workshop, it is expected that the ultrasonography machines which were lying idle in various animal health centers are efficiently utilized. In addition, we were able to conduct a joint training workshop on SOPs of Veterinary clinical services for the ecRLDC region at RLDC Zhemgang.

We were also very fortunate to have had an audience with His Excellency, The Prime Minister during the 3rd AM with PM session. Various issues such as shortage of manpower, lack of training opportunities, inadequate budget allocation and professional allowances were discussed.

During 2018-19, NVH has provided treatment to 18,121 cases, dewormed 2463 animals, and vaccinated 5,022 pets (dogs and cats) with Anti-Rabies and DHPPi+L vaccines. A total of 1417 pets (dogs and cats) were also registered and Nu. 1,18,100 was collected as pet registration fees and deposited as revenue. A total of 696 animals, especially dogs and cats were sterilized at NVH.

We have been able to achieve almost all the targets set out for 2018-19 except for implementation of Cost recovery scheme at NVH and seeking endorsement of the Bhutan Animal Welfare Standards and Guidelines from the GNHC committee.

Some of the constraints facing NVH are limited budget, lack of advanced diagnostic facilities, lack of advanced trainings and exposure for veterinarians and para-veterinarians in improving their professional knowledge and skills which are all essential components for delivering high quality and efficient veterinary clinical services. Despite all the constraints and challenges, NVH is focused to achieving its mission of providing "high quality veterinary clinical services for improving animal health and welfare in the country".

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

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1. 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 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.

1.1 Mission

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

1.2 Vision

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

1.3 Mandates

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

1.4 Veterinary Clinical Services

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

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

1.5 Proposed organogram

After the completion and operationalization of the new veterinary hospital, a new organogram was proposed to RCSC to enable provision of efficient clinical veterinary services (Fig 1).

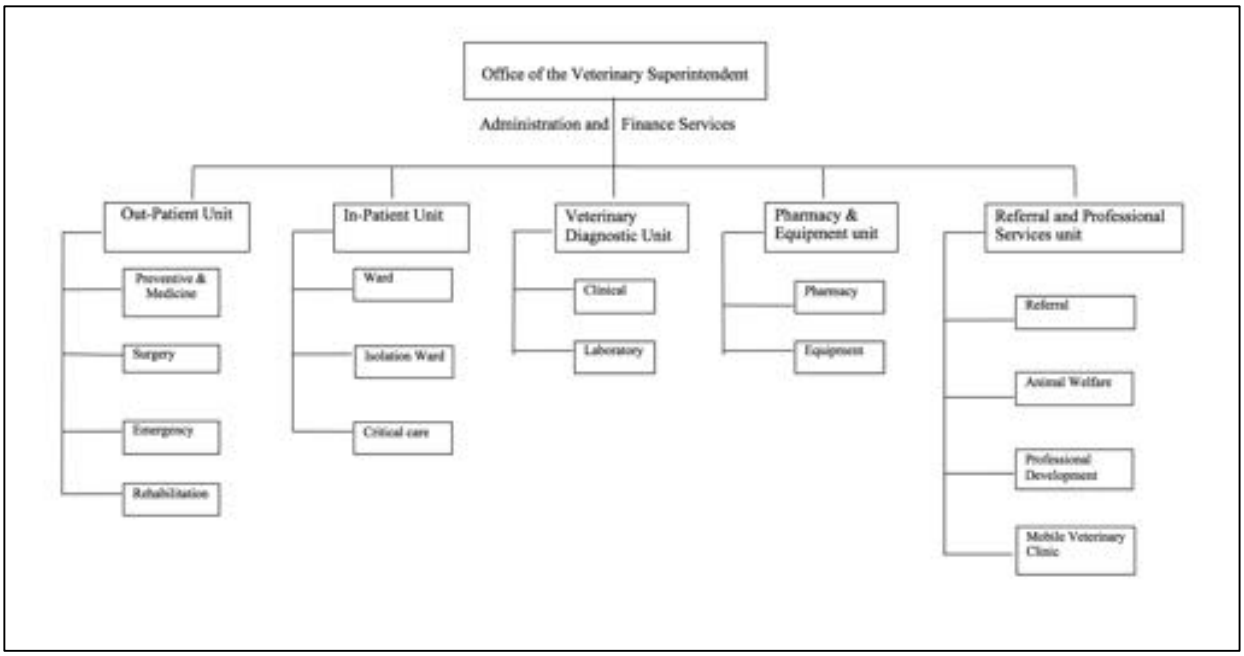


Fig 1: Proposed organogram for National Veterinary Hospital

The NVH has proposed to establish four Units (excluding administration and finance services) to broadly segregate works/ activities of the hospital since it is a technical agency. The units are further divided into 15 Sections inorder to delegate clear job responsibilities to ensure specialized services are carried out efficiently.

1.6 Human Resources

Dr. Kinley Dorji (Specialist Head)

The Sagacious Captain!

Dr. Pema Tshewang (DCVO)

Dr. Jambay Dorji (Sr. VO)

Dr. Meena Devi Samal (Sr. VO)

Dr. Nima Wangdi (Sr. VO)

The four Pillars!

Gembo Tshering (Sr. LHS-II)

Nidup Dorji (Sr. LHS-III)

Tshering Yangchen (Sr. LPS-III)

Sonam Zangmo (Sr. LHS-II)

Leela Maya Dahal (Sr. LHS-I)

Phuntsho Dema (Sr. LPS-III)

Neten Zangmo (Tech-I)

Tshultrim Choden (LHS-II)

Chimi Wangmo (LHS-II)

The Buttresses!

Kinzang Pelden (Asst. Lab Tech I)

Pema Tshomo (Sr. Lab Asst.)

Punya Mata Sanyasi (Asst. Lab Tech. I)

The Technician Trio!

Tula Maya Sharma (Sr. Admin Asst. V)

Ludup Pelmo (Admin. Asst. II)

The Administrative Orchestrators!

Norbu Gyeltshen Driver

Kiran Gurung Driver

Ugyen Phuntsho Driver

Tenzin Pelden GSP

Tshering Zangmo ESP

Tenzin Lhamo ESP

Bhim Bahadur ESP

The Upstanding Orderlies!

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

Currently, NVH has five Veterinarians, nine 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 three Animal attendants, three drivers and a sweeper. Three new staff joined and two left NVH during 2018-19 (Table 1 & 2).

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

Sl. No	Name	Designation	Date of joining	Previous place of work
1	Nidup Dorji	Para-veterinarian	22/1/2019	Dagana DVH
2	Kiran Gurung	Driver	1/3/2019	NA
3	Bhim Bahadur Gurung	Animal Attendant	15/5/2019	NA

Table 2: Staff who left NVH in 2018-19

Sl. No	Name	Designation	Date of leave
1	Jangchu Wangdi	Animal attendant	
2	Yonten Jamtsho	Night guard	1st June 2019

1.7 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 3). However, the hospital is planning to provide 24 hours' services in the future.

Table 3: 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		

2. Achievements 2018-19

A flower represents purity and joy. It enlivens the spirits of the beholders. It symbolizes success and accomplishments. It symbolizes fruition for dedication and hard work. We identify our accomplishments to that of the golden Sunflower, in its full bloom, radiating to reach out and share its ambrosia to all those seeking to realize their dreams!

2.1 Sensitization workshop on AEFI and ADR

Date:11/3/19

Venue : National Veterinary Hospital, Motithang

"People who are crazy enough to think they can change the world, are the ones who do".

- *Rob Siltanen*

Vaccination has long been an effective way to reduce disease burden in pets and farm animals, and is a key tool in maintaining animal health and welfare. Vaccines used in animals should be safe and effective. Vaccines are, however, not risk-free and adverse events occasionally occur following vaccination.

An adverse event following immunization (AEFI)/ vaccine adverse event (VAE) is any untoward medical occurrence which follows immunization and which does not necessarily have a causal relationship with the usage of the vaccine (WHO).

Vaccine Adverse reactions though encountered in the field are not formally reported. Even if it is encountered, the animal health worker cannot identify the reaction as VAE due to lack of knowledge or experience and thus gets neglected and unreported.

During the 34th DTAC meeting held at Paro in 2018, this issue was deliberated and subsequently it was recommended to sensitize the veterinary professionals on the AEFI/ VAE so that proper understanding and reporting mechanism is established to provide necessary interventions. Even during field visits to standardize Pet registration database, SOPs and sensitization of ADR it was found that most of the animal health workers were not familiar about it. Therefore, the sensitization workshop on Adverse Drug Reaction/ Adverse Event following vaccination in Livestock and pets was conducted by National Veterinary Hospital on 11th of March, 2019 at NVH conference hall.

The Sensitization workshop was attended by various stakeholders like AHD, NCAH, RLDCs, DVHs and NVH. Veterinarians from almost all the dzongkhags were present during the workshop.

The Objectives of the workshop were to:

- Sensitize field staff on identification of on ADR-AEFI
- Impart knowledge on counteracting ADR/ AEFI in the fields
- Prepare draft reporting system on AEFI

A series of presentations on ADR/ AEFI were made and group discussions organized to deliberate on the challenges in reporting of ADR/AEFI. One of the important resolutions of the workshop was the recommendation to revise the first veterinary Pharmacovigilance guideline – 'Pharmacovigilance for Adverse Veterinary Drug Reaction(s), Monitoring and causality assessment- 2017'.

Pic 1: Revision of ADR guideline

Subsequent to this recommendation, a Write- shop was organized by NVH at College of Natural resources, Lobeysa from 29/05/2019 – 02/06/2019. The Write-shop involved eight participants representing different stakeholders (NVH, RLDC, NCAH, CNR and DVHs). The objectives of this Write-shop were:

- Revise Veterinary ADR guideline
- Incorporate informative and comprehensive section on identification and reporting of AEFI.
- Improve reporting of ADR and AEFI.

The first veterinary ADR guideline - 'Pharmacovigilance for Adverse Veterinary Drug Reaction(s), Monitoring and causality assessment- guideline, 2017 was renamed as 'Veterinary Pharmacovigilance guideline'. The Write shop not only included detailed emendation of the ADR arising from usage of VMPs but also inclusion of AEFI.

Pic 2: Revised ADR guideline 2019.

Thus, the revised 'Veterinary Pharmacovigilance guideline- 2019' was aimed in giving comprehensive guidance on identification, reporting and monitoring of ADR and AEFI. In this guideline ABON system of causality assessment of the reports has been adopted.

2.2 Training workshop on Ultrasonography & Radiology

Date: 12-17/3/2019

Venue: National Veterinary Hospital, Motithang

"Today's accomplishments were yesterday's impossibilities".

- Robert H. Schuller

Background

The National Veterinary Hospital and a few of the animal health centers (RLDC Wangdue, Paro DVH, TVH Phuentsholing and Gelephu had procured Ultrasound machines in order to help provide accurate diagnosis and efficient treatment. Unfortunately, they were seldom being used due to lack of trainings on their usage and technical interpretations. Although, ultrasonography machine was being used regularly at NVH, it was mostly for pregnancy diagnosis as it doesn't require high level of expertise. The usages of this machine were self-taught but without formal training and necessary expertise, there are risks of misdiagnosing and misinterpreting the results. Therefore, formal trainings on their usages was important.

This training workshop was therefore, aimed to impart the veterinarians with necessary knowledge and practical skills to use advanced diagnostic tools such as ultrasonography and X-ray machines. With increasing demand for advanced veterinary clinical services it was high time that services provided at the animal health centers, especially at NVH, TVH & SL and DVHs were also upgraded. Most importantly, such diagnostic tools help in making accurate diagnosis, thereby increasing the efficacy of treatment. These machines which were lying idle across various animal health facilities could also be efficiently used.

The training workshop was provided by the Radio-imaging expert from the United Kingdom, Dr. Nicolette Hayward who is currently working as Director, Veterinary Diagnostic Imaging Ltd, UK. Three ultrasonography machines were provided for this training purpose by Mr. Sudarshan Girdhar, Sales Accounts Manager with IMV Imaging, India Pvt. Limited.

A total of 29 Veterinarians from National Center for Animal Health, Regional Livestock Development Centers, Dzongkhag Veterinary Hospitals, Satellite Laboratories/ Thromde Veterinary Hospitals, National Veterinary Hospital and College of Natural Resources took part in this training workshop.

Objectives:

- To train the veterinarians on use of ultrasonography and radiology machines
- To build collaborative linkages for future trainings

Expected outcomes:

- Adequate knowledge and skills acquired to provide independent diagnostic services
- Disease diagnosis and treatment efficiency improved
- Available diagnostic machines are efficiently utilized
- Referral of cases for advanced diagnosis made
- Collaborative linkages for future trainings established

Training details:

The training workshop consisted of theoretical lessons and practical demonstrations. The morning sessions were mostly devoted to theoretical aspects while the afternoon sessions were kept for

imparting practical/ hands on training to the participants.

Lectures on ultrasound of the gastrointestinal tract (GIT), pancreas, adrenals and urogenital tract (UGT) were presented and discussed. In the afternoons, the participants were divided into seven groups of four people and assigned one ultrasonography machine each for practice. OPD Pet dogs and cats as well as the dogs from Jangsa animal saving trust shelter at Serbithang were brought for practicing the scanning.

A lecture on radiography in small animals was conducted to familiarize the participants on the basic principles and physics of radiography. It comprised of various radiography topics viz; taking a perfect radiograph, Interpreting radiographs/ images, thoracic radiology, abdominal radiology, skeletal radiology and contrast radiography. After that, various radiography images of previous case studies were presented and discussed.

On the final day of the training workshop, a "One Care Session" was conducted. The participants were divided into groups to brainstorm and discuss on the key issues hampering the overall service delivery in the fields. The groups worked on the important goals of the animal health sector, identified issues/ constraints and accordingly brainstormed possible solutions. Different groups displayed their works as "post its" and they were further discussed with all the participants. The training workshop was formally concluded with awarding of certificates to the participants. The closing ceremony was graced by Hon'ble Dasho Secretary, MoAF.

Pics 3 : practical demonstration and scanning of patients

Pic 4: Certificate awarding

2.3 Training workshop on SOPs for Veterinary clinical services

10th – 12th June 2019

Venue: RLDC, Zhemgang

"Excellence is the unlimited ability to improve the quality of what you have to offer"

- *Rick Pitino*

National Veterinary Hospital in collaboration with Regional Livestock Development Center, Zhemgang conducted training workshop on Standard Operating Procedures (SOPs) for Veterinary Clinical Services" in east-central region at RLDC, Zhemgang. 36 livestock field staff comprising of 6 veterinary officers, 24 livestock extension agents and 6 laboratory technicians working in Zhemgang, Sarpang, Trongsa and Bumthang (east-central region) were trained on the SOPs.

Objectives:

- To enhance technical skills and knowledge to improve the productivity of veterinary professionals in east-central region.
- To provide better quality of clinical veterinary services to pet owners and farm owners.
- To improve personal safety of the staffs and clients and also to promote animal welfare at different farm levels.
- To provide a platform to discuss on clinical veterinary services and exchange of field experiences and knowledge.

Specific topics covered:

- Sensitization on Department of Livestock's policies, strategies and vision for Bhutan in general and Animal Health policies, Mandates of RLDCs and NVH.
- Achievements of DoL for the FY 2017-18
- Infrastructure development in the 11th FYP
- 12th FYP
- Climate smart and disease resilient development program
- Value chain and enterprise development program
- Research and extension service program
- Cost recovery scheme
- Herd health management
- Dog population and management guidelines
- Animal welfare guidelines
- Mandates of east central Regional Livestock Development Center (RLDC), Zhemgang
- Mandates of National Veterinary Hospital (NVH), Thimphu
- Adverse drug reaction (ADR) and adverse events following immunizations (AEFI)

Table 4: Modules and expected outcomes

Module	Topics	Expected Outcome
No. 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, handling of pet animals and protocols on clinical diagnostic services, anesthesia and surgery will be updated.
No. 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.
No. III Laboratory Bio-safety and Good Laboratory Practices	Standard laboratory practices involving sampling, packaging, storage, referral of specimens, bio-safety and bio-security practices, up-scaling laboratory diagnostic services in the region	Participants will understand disease specific sample collection, storage, shipment and standard laboratory protocols for laboratories in the region.
No. IV Essential Veterinary Drug Program	SOPs on veterinary medicines and vaccine management and storage, usage, dispensing, pharmaceutical waste management and disposal, ADR and AEFI	Participants will learn on effective and efficient management of veterinary drugs and vaccines through proper storage, usage, dispensing and procedures for management and disposal of expired drugs.
No. V Roadmap for ecRLDC	12th FYP priorities and programs for ecRLDC, develop blueprint and roadmap for control of regional priority animal diseases, strengthening rapid disease outbreak detection and containment in the region, effective dog population management and rabies control in the region, animal welfare and Tshethar guidelines	The participants will be sensitized on 12th FYP priority programs and projects for ecRLDC and strengthen disease prevention and control programs through development of blueprint or roadmaps.

Table 5: Standard Operating Procedures for Veterinary Clinical Services in the country.

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

Laboratory biosafety and good laboratory practices

- SOP on laboratory sampling.
- Standardization of laboratory bio-safety and bio-security.
- Standardization of laboratory test in RLDC, TVH and DVL.

Essential Veterinary Drug program (EVDP)

- Essential Veterinary Drug Program: its functional modalities; Management cycle for drugs, vaccines and equipment; Indenting, Packing and Distribution process.
- Non-compliances to BMRR 2012 observed in livestock centres in the region; Issues and way forward for instituting corrective and preventive actions.

Roadmap for ecRLDC

- Blueprint for the control of regional priority animal diseases for ecRLDC.
- Strengthening Rapid Detection and containment of disease outbreaks in ecRLDC.

Training evaluation

Participants were asked to fill up the pretest questionnaires before the training workshop to test their knowledge on various aspects of the SOPs on veterinary clinical services. At the end of training workshop, the participants filled up the same questionnaires (posttest) to evaluate as well as compare their understanding on the SOP training that were provided (Fig.3). There was significant increase in the level of understanding (84%) after the training compared to the result before the training (64%) and most of the participants scored an average of 87% compared to pretest score, which was 65%.

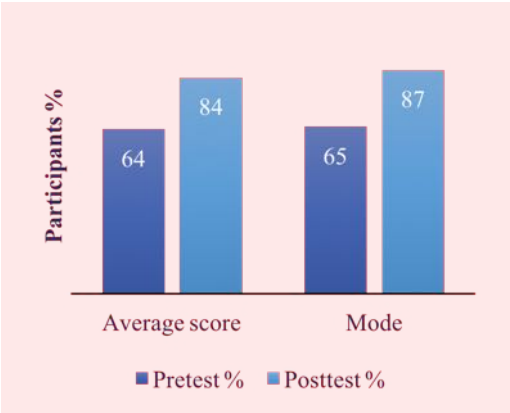


Fig 3: Pretest and posttest scores

The overall training outcome was evaluated based on eleven parameters (Fig 5). The participants gave their ratings on each of these parameters after the training. Almost all the participants were in favour of "strongly agreed" and "agreed" to the training evaluation parameters except for the "training time allotment" where eight of the participants "disagreed".17602445

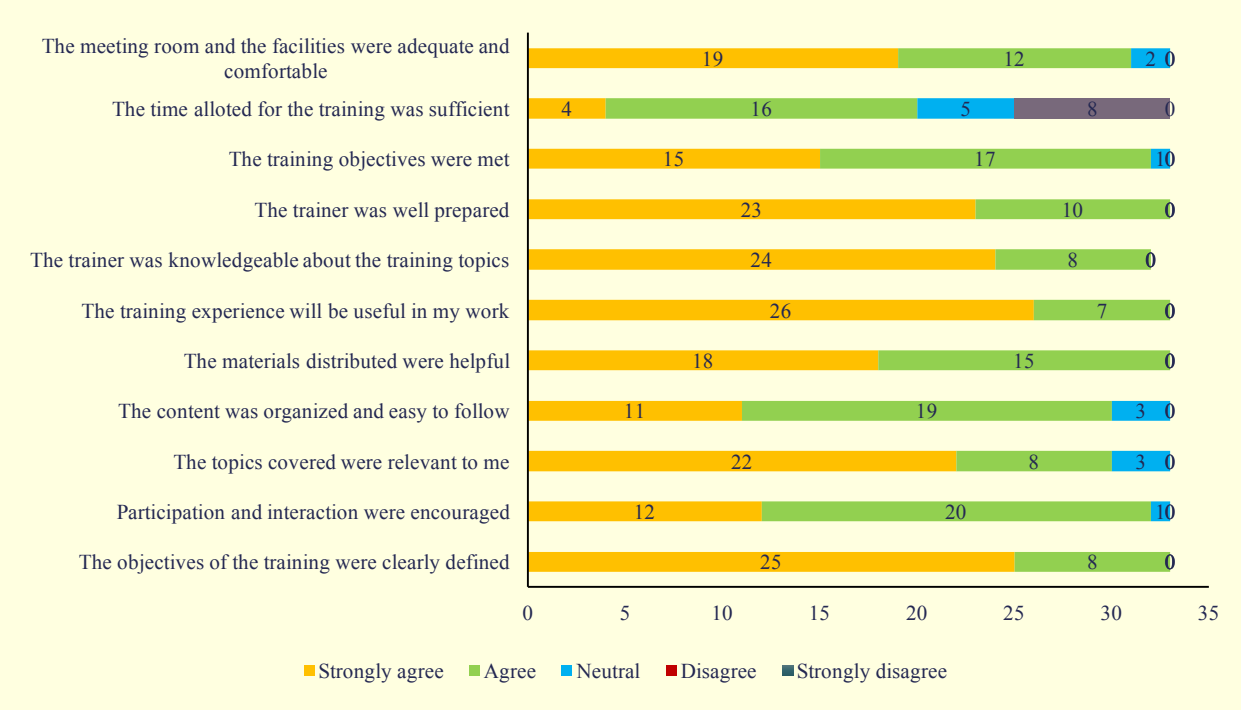


Fig 5: Overall training evaluation based on 11 parameters

Photos from the training

Theoretic sessions on SOPs

Group discussion on case scenarios

Practical demonstrations on examination of animals

Presenting case scenario results

Awarding of certificates

2.4 Field visits

"Life without endeavor is like entering a jewel mine and coming out with empty hands".

- *Japanese proverb*

Background

The Pet Registration database was developed by the Department of Livestock (DoL) in consultation with National Veterinary Hospital (NVH) to record the details of pet animals registered in the country and to help in planning and coming up with reliable disease prevention and control program for pets as well as for indenting of medicines and vaccines. The Pet registration database was officially launched in 2016 and subsequently, the demonstration on its operation and standard operating procedures on Pet registration were presented to the veterinary officers during Livestock Conference held at Bumthang in 2017. Only few hospitals have implemented the use of the database in their centers.

It is also observed that there is poor reporting of adverse events following immunization (AEFI) or Vaccine Adverse Events (VAE) from the veterinary hospitals and animal health centers that may be due to lack of awareness. Adverse events can range from minor side effects to life threatening reactions in animals following vaccination. This may be due to the vaccine or administration procedure or any other factors and necessitates our attention and proper recording since NVH is the pharmaco-vigilance center for veterinary services.

NVH is the custodian for veterinary clinical services and as such is mandated to provide technical backstopping across the country. In this regard, teams from NVH visited the centers with the preset terms of reference (ToR) as detailed below:

1. Introduce and train the focal person on the operation of database and standard operating procedures (SOP) on pet registration.
2. Review existing pet registration registers for standardization.
3. Identify and address any issues related to pet registration procedures & database.
4. Sensitize AEFI/VAE to field staff.
5. Provide guidance on identification, response and reporting of AEFI/VAE.
6. Provide technical backstopping on clinical veterinary services.

The teams visited 42 centers during the field visits (Table 6).

Table 6: Total number of centers visited.

Centers	Nos
Veterinary Hospitals	22
Animal health Centers	19
Total	41

Specific topics/activity covered:

- Presentation on NVH mandates, organogram, institution set up, challenges and way forward
- Presentation on SOP for pet registration and demonstration on the operation of the database
- Presentation on AEFI/VAE
- Inspection and monitoring

Findings:

1. Pet registration and vaccination

Out of 39 centers, 32 centers provide pet registrations services (82%) and all the VHs provide the services (100%). However, only 54% of the centers charge the public for the services (Fig 6). 80% of the VHs do not use database to store the information on pet registration (Fig 7).

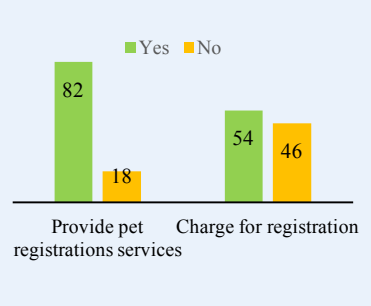


Fig 6: Pet registration services

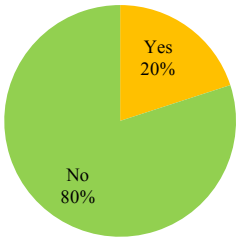


Fig 7: Use of database at VHs

Vaccination	Nos of centers
ARV	10
ARV & DHPPi+L	31

Table 7: Pet vaccination at VHs

31 centers provide anti-rabies (ARV) and DHPPi+L (distemper, hepatitis, parvovirus, parainfluenza and Leptospira) vaccines to pets and 10 centers provide only ARV (Table 7).

2. Laboratory facility

A total of 21 VHs out of 22 hospitals have laboratory section except Monggar DVH. However, seven VHs do not have laboratory technicians despite having laboratory facility (Fig 8 & Table 8). The laboratory room is equipped with basic facilities and carry out fecal, blood and skin examinations. The centers refer their samples to respective regional labs and national lab for further test.

Table 8: VHs without lab technicians

SL no	VHs
1	Punakha
2	Deothang
3	Zhemgang
4	Samdrup Jongkhar
5	Trashigang
6	Monggar
7	Haa

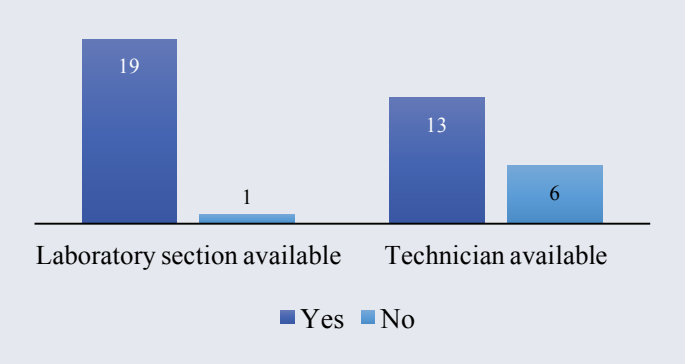


Fig 8: Availability of laboratory section and technician

3. Adverse drug reaction (ADR) and adverse events following vaccination (AEFI)

51% of the centers visited were aware about ADR and AEFI while 49% were unaware (Fig 9). 40% of the center have encountered ADR and AEFI but only 25% reported to higher authorities and do not record events in the register (100%). Only 1 center has AEFI kits in the center (3%).

Fig 9: Awareness on ADR and AEFI

Recommendations:

1. DVHs should record the pet registered in their centers in the database and maintain it up to date. For the registration procedure, it is recommended to follow SOP for pet registration.
   Action: DVHs with immediate effect.

2. The center should process for revenue receipts immediately and commence charging fees at the prescribed rates and issue receipts to the owners. Meanwhile for the animal health centers in the Geogs without revenue receipts, the cash generated shall be handed over to DVH in-charge to deposit into the revenue account and issue the receipts on a monthly basis, which shall be handed over to the pet owners.
   Action: DVHs and RNR-ECs/LECs with immediate effect.

3. For the Animal health centers in the Geogs, it was recommended that pet registration should be recorded in the register or excel sheet in the computer and the progress should be submitted monthly to DVH for updating into the database.
   Action: RNR-ECs/LECs and DVH with immediate effect.

4. Considering the importance of maintaining the record of pet population accurate, annual renewal of pet registration and updating the database as well as in the pet booklet is found necessary. Hence, during renewal of pet registration, updates will be carried out in the database as well as in the pet book in Page nos 24-27. Refer SOP for Pet registration under renewal.
   Action: DVH and RNR-ECs/LECs with immediate effect.

5. The participants recommended that the database should be made available online and further improvement is needed in the database to make it a robust one.
   Action: NVH and Animal Health Division (AHD), DoL

6. DVH and animal health centers should record VAE if they encounter and report to NVH. A copy of the report shall be submitted to RLDC, Zhemgang. For the time being ADR alert may be used to report VAE.
   Action: DVHs and RNR-ECs/LECs with immediate effect.

7. DVH and animal health centers to arrange VAE kit to encounter adverse events anytime.
   Action: DVHs and RNR-ECs/LECs with immediate effect.

2.5 Mobile veterinary clinical services in highland areas

Date: 24/6/19

Venue: Merak geog, Trashigang

"Without ambition, one starts nothing. Without work, one finishes nothing. The prize will not be sent to you. You have to win it."

- Ralph Waldo Emerson

The National Veterinary Hospital is mandated to provide clinical veterinary services to the highland population since 2016. His Majesty The 5th King has particularly stressed on the need to providing adequate clinical veterinary services to the people of highland areas since they are living in remote areas without access to these facilities and services. The livelihood of the people is dependent on rearing of livestock, mainly yaks. Therefore, National Veterinary Hospital (NVH) has included the mandate of providing clinical veterinary services to the people of highland areas similar to the concept of Kidu Mobile Veterinary Clinic (MVC) to improve the health and production of the animals.

Yaks, horses, sheep and mastiff dogs are the important species of animals reared by highlanders. These species of animals are main source of livelihood to the highlanders with the production of milk, meat, wool and various other products. Out of twenty dzongkhags, ten dzongkhags are along the northern belt and falls under highland areas.

The main objective of this program is to understand the problems faced by the highlanders while rearing livestock (including mastiff dogs) and provide necessary help through delivery of "at the doorstep" veterinary clinical services. The expected outcome of this program is improved health of the livestock which will lead to increased productivity and income generation.

The MVC will provide animal health services ranging from basic first aids to major surgeries presented to the team during their visits. The various animal health/ clinical veterinary services that will be provided are as follows:

- General animal health check up
- Treatment of sick and wounded
- Deworming
- Ectoparasite control
- Vaccination
- Surgical interventions (as and when required)
- Sterilization if required
- Provide feed supplements
- Animal health related consultation/ advices/ awareness
- Animal husbandry/ management advices
- Sample collection for disease screening

2.5.1 3rd Royal Highland Festival, Laya

The Royal Highlander festival was first introduced on 16th October 2016 to mark the celebration of the birth of HRH the Gyalsey; 400 years of Shabdrung Rimpoche and the Rabjung (60 years' cycle) birth year of Guru Rimpoche. The festival is a landmark activity of Gasa dzongkhag's "Good to Great Gasa", a vision inspired by His Majesty's passion to make our country great. This annual event is also a form of expressing the gratitude for the important role the highlanders play in preserving our unique culture and heritage. The festival is also an opportunity for highlanders from other parts of country to partake in the extravagant display of colorful decorations, promotion and sale of local products, animal shows, fun filled celebrations and so on. Since 2016, NVH has been participating actively during the Royal Highland Festival at Laya, Gasa.

The 3rd Royal Highlander Festival (RHF) was organized in Laya from October 23-24, 2018. Team from NVH set up a veterinary clinic to cater to the needs of the highlanders during the festival. The Clinic had provision for conducting surgery (sterilization) for dogs and cats and kept stock of various medicines such as intra-mammary infusions, anthelmintic, antiseptics and feed supplements. Consultation on animal health and care were also provided through the clinic.

A total of 16 households were provided with feed supplements, anthelmintic, antiseptics, intra-mammary infusions, cotton and bandages. There were request for sterilization of the dogs and cats but due to continuous snow fall and cold weather conditions, sterilization was not carried out.

NVH representatives were also involved in Pre-selection, technical judging (of heifer, horse, mastiff dogs and calves during the animal show) and facilitation for voting, vote counting, and result preparation. NVH along with other central and dzongkhag agencies under the department of livestock were involved during the festival.

Preselection of animals

NVH clinic set up

Best bull awardee

2.5.2 Awareness program for MVC for highlanders

A team from NVH visited Merak gewog under Trashigang dzongkhag to provide awareness on MVC to the people residing at Merak. As per the ToR of MVC the team shall comprise of representatives from NVH, respective RLDCs, DVH and LECs. For the current program following members were involved:

1. Dr. Karma Phuntsho (Sr. VO) - SVL, Nganglam
2. Pema Jamtsho (Sr. LPS) - DVH, Trashigang
3. Tshering Yangchen (Sr. LHS) - NVH
4. Pema Tshomo (Lab. Tech) - NVH

Objectives:

- To create awareness on the concept and modalities of Mobile Veterinary Clinic
- To understand issues related to animal health to plan for necessary interventions

The awareness program on MVC was conducted on 24th of June, 2019 at geog administration hall. A total number of 121 participants including head of the geog (Gup) were gathered. The opening session was addressed by Gup to the public on the importance and objectives of the meeting. The officer in-charge of DVH, Trashigang formally introduced the MVC team and purposes of their visit.

The MVC team gave a brief background introduction on the department's goals and aspirations particularly with regards to improving the animal health and productivity thereby, contributing to the income generation and economy for the country. The team reiterated on the important roles the highlanders play in protecting the sovereignty of the country and preserving the unique culture and traditions. Representatives from NVH presented an overview of NVH and its mandates. The concept of MVC and various types of clinical veterinary services that can be rendered to highlanders through this program were also briefed to the participants.

During the course of the program several issues were discussed as under:

- During FMD outbreaks, the sale of animal products is banned which has significant impact on their livelihood. There needs to be appropriate interventions to compensate the loss from the department.

  Awareness on the importance of vaccination for prevention of diseases like FMD were provided. Issues on non-compliance during vaccination program in the fields were reported before and therefore, they were requested to provide necessary cooperation to the animal health workers during mass vaccination programs. Compensation by government during outbreaks could only encourage people to avoid vaccination.

- Need AI facilities and expectation of female progeny by public from Guling Toka. Challenges of having AI facility as well as funding issues were explained. A proper assessment needs to be conducted to establish any facility.
- Farmers are procuring the breeding bull (mencha) without informing livestock centers and there is issue of low fertility rate. People suggested clarification on procurement procedure from the sector.

  The breeding bull (mencha) is available in Arong, Samdrup Jongkhar. The geog livestock extension officer needs to get the requisition from the farmers which will then be forwarded DVH through geog administration for procurement.
- Issue on inadequate medicine at the geog center was raised. Especially during emergencies, necessary medications cannot be provided which results in death of animals.

  Medicine indenting is done as per the availability of budget and supplied accordingly to geog centers. Since geogs have more budget, it was suggested to use the geog budget to procure emergency medicines and feed supplements. The Gup agreed to consider and plan the budget accordingly.
- The farmers were interested and sought information regarding the insurance of their livestock.

  Insurance can be done by the owners as per their interest and geog officer can help with the procedures. If the animal is procured through government, 20% of the insurance shall be done by government in the first year followed by owner for the following years. Insurance rate is 15% of total cost of animal.
- Several diseases such as Shamney (Plant poisoning), Gid and red urine in yaks are commonly encountered which proves to be fatal over a couple of months' period due to inadequate interventions.

  The MVC will take stock of all the issues and interventions needed to be made during its next visit. MVC shall inform the stakeholders 1-2 weeks prior to the program so that they can be well equipped to tackle all issues faced by the highlanders. The highlanders recommended the MVC to visit during December since their herd migrates during other months.

Table 9: The MVC distributed the following items to the highlanders based on the case history they submitted:

Sl. No	**Particulars**	**Conditions**
1	Deltamethrin/ Cypermethrin/ Ivermectin tablets	Ectoparasite control
2	Triclabendazole bolus	Endoparasite control
3	Povidone iodine/ Lorexane / Gentamicin cream	Wound treatment
4	Paracetamoil + meloxicam bolus	Limping
5	Anti- diarrhoeal powders	Calf diarrhea

Photos from the Highland tour



Creating awareness & discussing issues



Distributing medicines and serving Working lunch

"Every accomplishment starts with the decision to try."

- Anonymous

2.6 AM with PM session

Date: 5th April 2019

Venue: National Veterinary Hospital, Motithang

"A dream does not become reality through magic; it takes sweat, determination, and hard work".

- Colin Powell

His Excellency the Honorable Prime Minister, Dr. Lotay Tshering visited NVH (as a part of HE's AM with PM session) on 5th April 2019. HE Lyonchen explained that the "AM with PM" was initiated to make use of the morning hour (8:30am-9:30am) to visit offices and interact with the staff to understand their problems. The visit to NVH was the 3rd such session after meetings with Supreme Court officials and Ministry of Foreign Affairs.

A short presentation on the overview of NVH was presented. After the brief presentation HE Lyonchen invited staff to raise issues. The Following issues were raised:

Lack of ex-country training opportunities:

None of the staff at NVH has availed any sort of trainings related to clinical veterinary services until now. NVH has shifted to the new state of the art hospital and procured a few advanced diagnostic equipment but the necessary training on their use have not been availed. Unlike other professions, the veterinarian, para-veterinary professional and lab technicians need to be trained outside the country only, since there is no expertise/ required institutional capacity to provide advanced trainings on veterinary clinical services in the country.

Status/ interventions made by NVH/ DoL:

Ex-country HR training falls under the capital budget and despite repeated annual budget proposals being put forth to the Department of National Budget, MoF, it's not approved. Ex-country training is mostly supported through project grants/ funding only. Unfortunately for NVH, there has not been any projects to support such trainings.

With the help of the department, NVH had signed an LoU (letter of understanding) between Kasetsart university, Bangkok in 2015 to train the veterinarian and para-veterinary professionals at Kasetsart university. However, there has not been any help received from the LoU until now.

Budgetary issues:

NVH has been receiving the same budget even after shifting to the new hospital, which is a two storied building excluding the basement. The old hospital at Chubachu was a cottage type house with only four rooms and a toilet. NVH at the new facility is able to provide additional services with procurement and establishment of advanced equipment. The staff strength has also increased to 25 numbers as opposed to 20 before. As the apex body and referral center for clinical veterinary services, NVH has expanded its activities and services which incur additional expenses. Especially at a hospital setting, where routine activity involves coming in close contact with sick animals, consumables such as gloves, hand sanitizers, hand towels, face masks, soaps, detergents, disinfectants etc are heavily used. Due to limited budget, their supply is limited which exposes the staff to serious occupational risks.

Status/ interventions made by NVH/ DoL:

For 2019-20 financial year, NVH has proposed Nu. 22.245 million (Current 5.763 millions and Capital Nu 16.482 millions). Out of the capital budget of Nu.16.482m, Nu. 4.3m is proposed from Rural Development Climate Change Response Programs (RDCCRP) out of which 2.3m is allocated for setting up microbiology laboratory and equipment.

Advanced diagnostic equipment:

NVH has put up various proposals to procure diagnostic equipment from RGOB budget. As capital budget is restricted, procurement of these machines did not materialize. To provide efficient veterinary clinical services, advanced equipment such as endoscopy, ultrasound and X-ray machines play very important roles. His Majesty, the 5th King granted a private audience to Dr. Kinley Dorji, Head, NVH on September 3, 2018. Upon His Majesty's command, NVH submitted a list of essential equipment [digital x-ray; advanced imaging ultrasound; gaseous anesthetic machine; video endoscopy] to His Majesty's Secretariat. Dasho Zimpoen had forwarded the letter to NVH to seek support from RGoB.

Status/ interventions made by NVH/ DoL:

NVH has included the procurement of the above mentioned list of equipment in the budget proposal for 2019-20 and also constantly exploring fund support from NGOs. There has been a couple of clients who were interested to help mobilize fund for procurement of a few of these machines. NVH is constantly keeping in touch with these benefactors.

Additional requirement of Para-Veterinarian and ESP staff (Animal Attendant):

NVH has nine paravets and 3 ESP staff. The number of cases coming to the hospital is increasing and the staff providing the services has remained the same over the years. NVH is providing services even after office hours (3-8pm during weekdays, 9am-5pm during Saturdays and 9am-3pm during Sundays and government holidays. Therefore, additional para-veterinarians are required to provide uninterrupted services.

There is demand for 24 hours' services by the public, especially during emergencies. The new hospital has provision for inpatient housing of sick animals which need continuous monitoring. Additional number of ESP are also required since handling and treating of animal patients often require two to three personnel. The animals which are brought at the hospital most commonly litter the hospital with excrement which requires frequent cleaning to ensure cleanliness and hygiene of the workers as well as to prevent further spread of diseases.

Status/ interventions made by NVH/ DoL:

The proposal for additional HR requirement was submitted to RCSC through department and HR division in 2018. The proposal is under review.

Professional Allowance:

Animal health workers such as Veterinarians, Para-veterinary professionals and laboratory technicians are frequently exposed to occupational hazards as they have to deal with sick animals that could potentially carry zoonotic diseases. Since, the diagnostic capacity in animal health is not strong, this makes it more challenging. During disease outbreaks, animal health workers are the frontline workers who contain the diseases. There has been report of a veterinarian and four para-veterinary professionals getting infected with Brucellosis. This is only a few reported cases. There could be more if proper investigation is carried out. Animal health workers are also risking physical injuries that could cripple them for life or even cause death, especially when handling large animals such as cattle and horses. Moreover, the working hours for animal health workers are not fixed, since disease occurrence/ emergencies are unpredictable and not time bound. The working environment for animal health workers are also very unhygienic as they come in contact with animal excrements, discharges and foul odour which stains the clothes and nose for a long time. Therefore, animal health workers merit special consideration for professional allowance with regards to the occupational risks associated to the profession.

Status/ interventions made by NVH/ DoL

A proposal for professional risk allowance was put forth for review and consideration to the 4th Pay commission through the department and Ministry.

Recommendations from PMO

HE Lyonchhen took note of the issues and assured to get back with possible interventions made within a period of one week. HE Lyonchhen reiterated that all the issues might not be resolved completely but through appropriate networks, most of them could be addressed. For trainings on USG, X-ray and Laboratory services, HE Lyonchen suggested NVH to establish proper network with JDWNRH since the basic principles are the same which could be taken advantage of.

Update on action taken by the PMO

The PMO had instructed relevant offices like the MoAF, RCSC, Finance and BPC to study the issues submitted by NVH and provide support wherever possible.

NVH also received following items from PMO on 8/4/19:

i.	Bactorub Blue (Hand Disinfectant)	- 20 bottles
ii.	Disposable examination gloves	- 20 packets
iii.	Disposable Surgical Gloves	- 30 packets

2.7 Veterinary clinical services

The regular public services provided by NVH include treatment to sick animals including surgical interventions. Deworming and vaccination along with pet registration are also carried out every day. However, sterilization services are scheduled only twice a week (Tuesdays and Fridays). For 2018-19, the achievements with regards to these services are summarized in the Table 10 below.

Table 10: Summary of clinical veterinary services for 18-19

Activities	Particular	Total
Clinical cases (treatment)	New (6164) Repeat (11957)	18121
Parasitic control	Ecto/ endoparasite	2463
Surgical cases	Other than sterilization	109
Vaccination	DHPPi + L	2428
	ARV	2594
Pet registration	For dogs and cats	1417
Sterilization	Conducted routinely at NVH	696
Contraceptive services	Medroxyprogesterone injection/ tablet	81

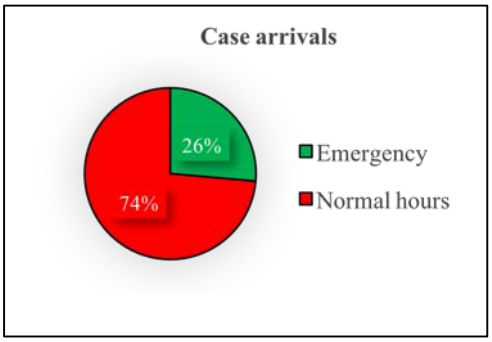


Fig 10 & Table 11: Emergency and normal case arrivals at NVH

Category	Numbers
Emergency Cases	4780
Normal hours	13323
Referral Case	18
Total	18121

2.7.1 Clinical cases

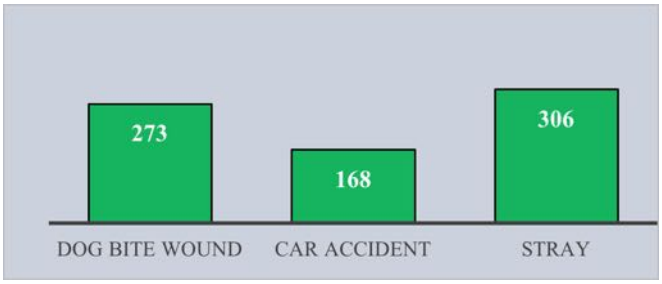
A total of 18121 cases of different animal species (annexure 1) were brought and treated at NVH in 2018-19. Out of the total cases, 4780 (26%) were brought during emergency hours and 13323 (74%) were brought during normal working hours. NVH had also received 18 referral cases from other animal health centers (Table 10, 11 and Fig 10).

From the total cases, 6164 were new cases and 11957 were repeat cases (cases which were brought for follow up treatment). The highest number of reported cases were related to worm infestations (5589) followed by GI affections (1253). Several conditions like the skin, musculoskeletal system and general non-defined cases were also reported in high numbers.

Cardiovascular (27), poisoning (44) and metabolic deficiency (55) conditions were among the lowest reported cases while respiratory, urogenital, nervous and specific infection cases were occasionally observed (Table 12).

Table 12: Various cases brought at NVH

Disorders	No of cases
GI conditions	1253
Respiratory conditions	82
Urogenital conditions	73
Skin affections	876
Musculoskeletal conditions	923
Cardiovascular conditions	27
Nervous disorders	81
General conditions	335
Eyes & ear affections	192
Metabolic and deficiencies	55
Specific infections	72
Poisoning	43
Worm infestations	5589



Note: due to increase in vehicular traffic, human population and stray dogs, certain incidences like dog bites and motor vehicular accidents are increasingly being reported at the hospital. In 2018-19 alone, 273 dog bites and 168 cases of dogs/ cats being hit by cars were recorded. Apart from pet animals, stray dogs/ cats are also being rescued and brought at the hospital for treatment. 306 stray, especially dogs had received treatment in 2018-19 (Fig 11).

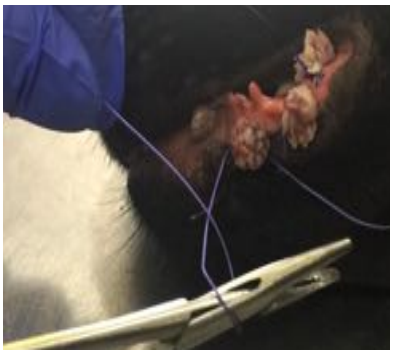
Fig 11: Dog bite, car accident and stray cases

2.7.2 Surgical cases

Ranges of surgical cases were presented at NVH during 2018-19. A total of 109 surgical cases were recorded at the OPD. Suturing of general wounds was recorded highest (46) followed by dog bite wounds (11) and mammary tumor removal (10). Some of the advanced surgeries like Cherry eye correction (Modified Morgan's technique), herniorrhaphy and bone pinning were also conducted. A single case each of rectal prolapse correction and exploratory surgery were recorded (Table 13 & Fig 12).

Cherry eye correction

Bone pinning surgery



Ligation of oral papillomas

Table 13: Various Surgical affections

Surgery	Numbers
Mammary Tumor	10
Hematoma	4
Papilloma	6
Dog bite wounds	11
Wounds/ re-suturing	46
Cherry eye	5
Hernia	6
Exploratory surgery	1
Amputation	8
Bone pining	4
Fracture correction	4
Rectal Prolapse	1
Dystocia	3
Total	109

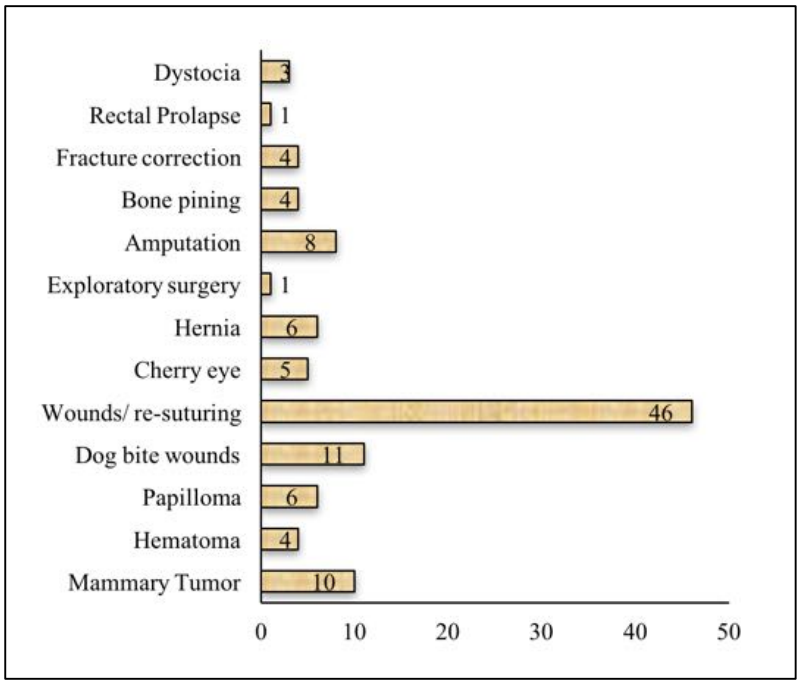


Fig 12: Bar graph showing different kinds of surgical affections

2.7.3 Sterilization

NVH provides routine sterilization services to the pet animals twice in a week. This year, NVH sterilized 696 animals, especially pet dogs and cats (Table 14 & Fig 13). Five horses and a bull were also sterilized. Out of the total pet dogs brought for sterilization at the hospital 159 were males and 323 were females. In case of pet cats, the number of females sterilized (138) was almost double than that of males (70). The total castration done in all animal species was 231 (34%) and OH was 461 (66%) (Table 15 & Fig 14).

Table 14: Sterilization details of the animals

Species	Sterilization	Contraceptive
Dog	482	44
Cat	208	37
Horse	5	0
Cattle	1	0
Total	696	81

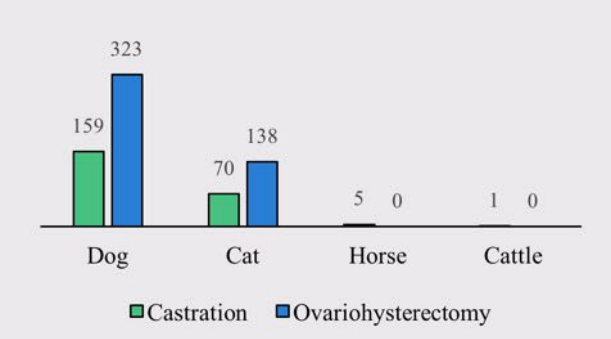


Fig 13: castration and OH in different animal species

Some pet owners prefer non-invasive technique of birth control, especially for dogs and cats. Non-invasive birth control is provided through contraceptive injection/ tablet Medroxy progesterone. A total of 81 pets; 44 dogs and 37 cats were given the contraceptive (Table 14).

Table 15: Sterilization types in different animal species

Species	Castration	Ovariohysterectomy
Dog	159	323
Cat	70	138
Horse	5	0
Cattle	1	0
Total	235	461

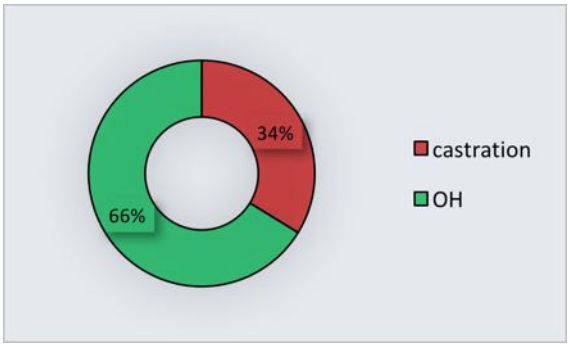


Fig 14: Pie chart of castration and OH conducted

2.7.4 Vaccination

There are two types of vaccines available for dogs (DHPPi+L and ARV) while cats are provided with only ARV. A total of 2428 and 2189 pet dogs were vaccinated with DHPPi + L vaccines and ARV respectively. Only 405 cats were vaccinated against Rabies (Table 16).

Table 16: ARV and DHPPi+ L vaccine coverage

Species	**Vaccination**	**Numbers**
Canine	DHPPi+L	2428
	ARV	2189
Feline	ARV	405

2.7.5 Pet registration

One of the important services provided by NVH is registration of pet animals. Only dogs and cats are registered with NVH as of now. For 2018-19, a total 1417 new pets were registered out of which 1108 were dogs and 309 were cats. Pet registration renewal (yearly renewal) for 1081 dogs and 96 cats were also recorded (Table 17 & Fig 15).

During the registration of pets, a registration fee of Nu. 100/- is collected to recover the cost of printing registration booklets. During 2018-19, a sum of ***Nu. 1,18,100/-*** was collected as pet registration fees. The amount was deposited as revenue to the government.

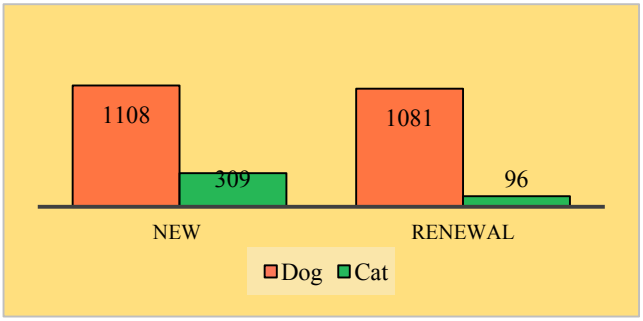


Fig 15: New and renewal pet registration for dogs and cats

Table 17: Pet registration details for 2018-19

Species	Pet Registration		Total
	New	Renewal	
Dog	1108	1081	2189
Cat	309	96	405

2.7.6 Deworming

A total of 2463 animals including poultry were dewormed. The highest number dewormed was the canine species while poultry (70) and cattle (75) were dewormed the least (Table 18 & Fig 17).

Table 18: animal species dewormed in 2018-19

Species	**Numbers**
Dog	1905
Cat	413
Poultry	70
Cattle	75
Total	**2463**

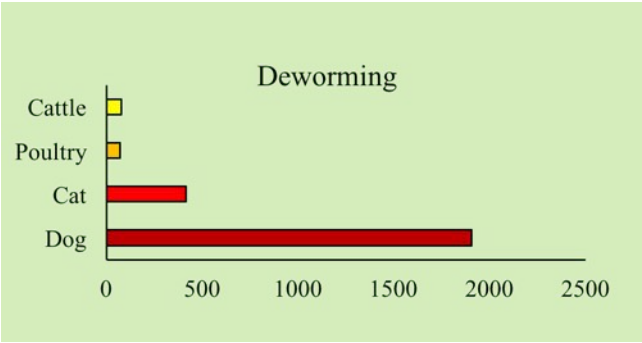


Fig 17: Deworming in different animal species

2.7.7 Other services

Apart from routine clinical veterinary services, a few of additional services were provided from 2018-19. Although, NVH had procured an ultrasound machine, it was not fully utilized due to lack of formal training. After the training in March 2019, ultrasound machine was frequently used. 139 patients received ultrasonography scanning (Fig 18).

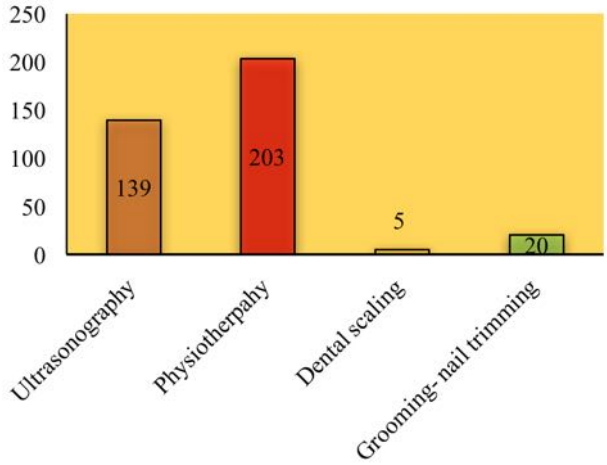


Fig 18: Various services provided to the pets

NVH had also procured and established a Rehabilitation (physiotherapy) section to provide necessary help to patients affected with mobility. Since its establishment in 2018, physiotherapy services was provided 203 times. Five dogs that had dental tartar/ caries were also provided with dental scaling services. For nail trimming 20 pet dogs were brought at the hospital (Fig 18).

Apart from other technical services, health certificates and vaccination certificates (especially for pet animals which are taken outside the country by the expats when they return back to their country) are also provided by NVH. For in-country movement of animals (both large and small), NVH also provides health certificates. In 2018-19, NVH had provided three health certificates and Rabies Free certificates each for expats who adopted the local dogs and took them back to their country after their work tenure was completed in Bhutan. For local people, about 4 health certificates were provided for large animal transportation in 2018-19.

Photos of new and advanced services provided at NVH in 2018-19

Before Dental scaling After



Ultrasound diathermy therapy (physiotherapy) for paraplegic patients

USG image of Pleural effusion

USG assisted Thoracocentesis in a patient

2.8 Laboratory services unit

Currently, there are two laboratory sections; Hematology and Parasitology. Establishment of Microbiology section is in the pipeline. A feasibility study for establishment of Microbiology lab was conducted with the help of NCAH and based on the recommendations of the feasibility report, necessary budget was proposed and approved through the RDCCRP. The laboratory section is managed by three laboratory technicians. Various services provided under the laboratory section are given below in table 19.

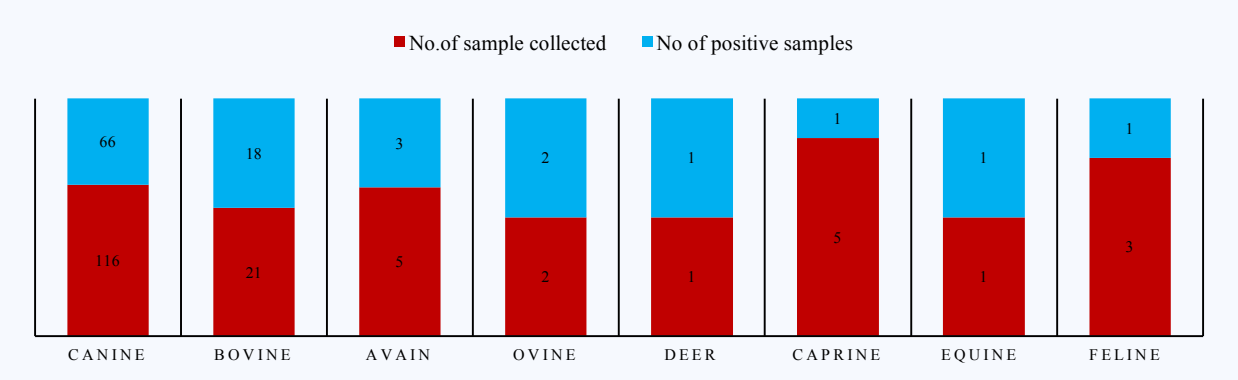
Table 19: Services provided by LSU

Hematology	Parasitology	Urine analysis	Biochemistry
- DLC - Hb/dl - Blood Parasites Exam	- Fecal examination (direct, Stoll, floatation and sedimentation methods used) - Skin scrapping using 10% KOH digestion method (fungal culturing of skin scrapping samples are referred to NCAH) - Tick identification	Urine test using Urit 50 machine: - Leucocytes - Bilirubin - Protein - Glucose - Specific Gravity - Nitrite - Ketone - Urobilinogen - Blood	- Lactate dehydrogenase system pack - SGOT system pack - Cholesterol system pack - Glucose system pack - Bilirubin system pack - Urea system pack - Total protein system pack - Creatinine system pack

2.8.1 Parasitology

Fecal examination

The total number of fecal samples received in 2018-19 was 159 out of which 395 tests for endo-parasites were carried out. The fecal samples are examined using Direct, Stoll and Sedimentation methods. The fecal samples were collected from various animal species viz; avian, bovine, canine, caprine, deer, equine, feline and ovine. The fecal examination of these species revealed presence of different parasites (Fig 19). Strongyle and Coccidia were detected in avian samples. For bovine samples, the common parasites observed were Fasciola, Ascaris, Strongyle, Paramphistome and Dicrocelium. In case of canine species, Toxocara, Ancylostoma, Strongyle and Isospora eggs were found. In a single fecal sample collected from a rescued deer, mixed infection of Paramphistome, Strongyloids, Coccidia and Strongyle eggs were detected (Fig 20).



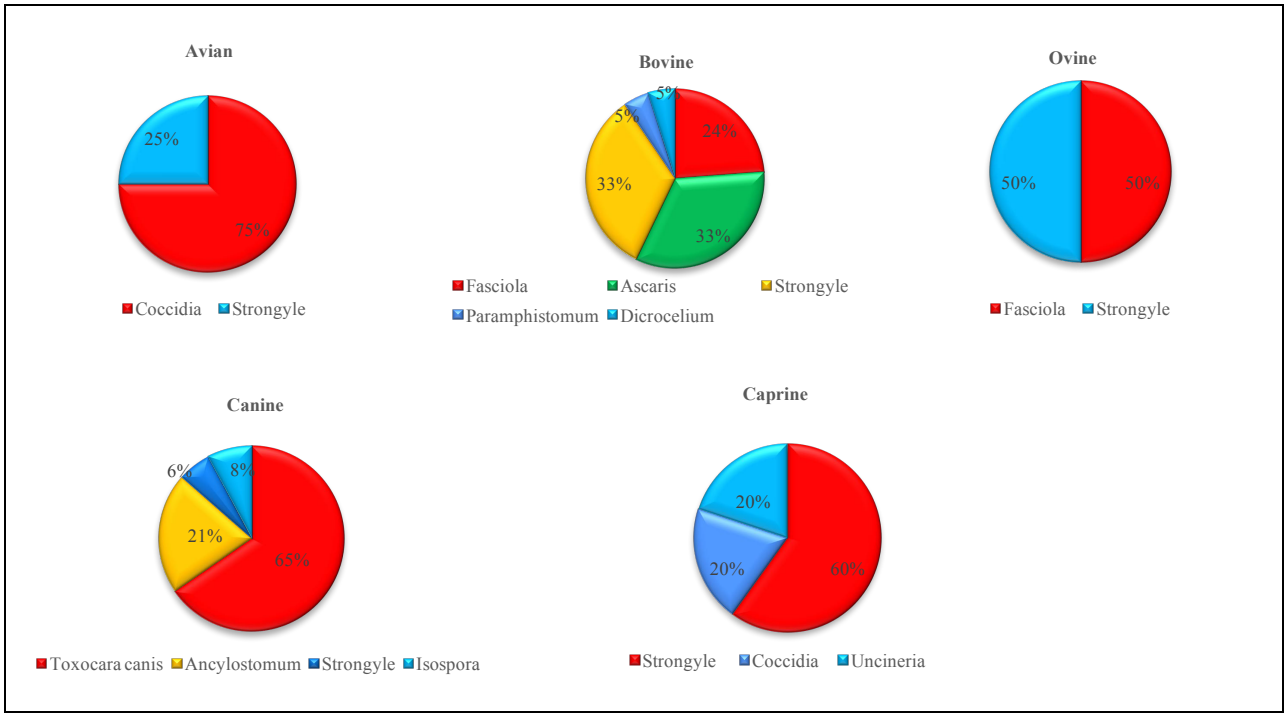


Fig 19: Fecal samples collected and tested from different animal species during 2018-19

Fasciola spp. *Uncineria spp.* *Ancylostoma spp.* *Toxocara canis*

Fig 20: prevalence of various endoparasites in different animal species

Skin Scrapings

Skin scrapings were collected from animals (especially canine) suffering from dermatitis. A total of 157 samples were collected. The samples which were positive for external parasites (mites) revealed presence of Demodex, Psoroptic and Sarcoptic mites (Fig 21). A total of 67 samples which were negative to mites were referred to NCAH for fungal culture. some of the fungal culture reported presence of *Trichophyton verrycosum* (dermatophytosis), *Rhizopus spp (Zygomycosis), Microsporum nanum* (dermatophytosis) and *Microsporum. canis (Ringworm).*

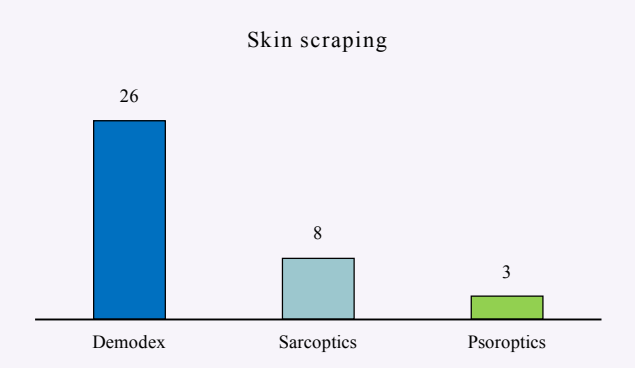
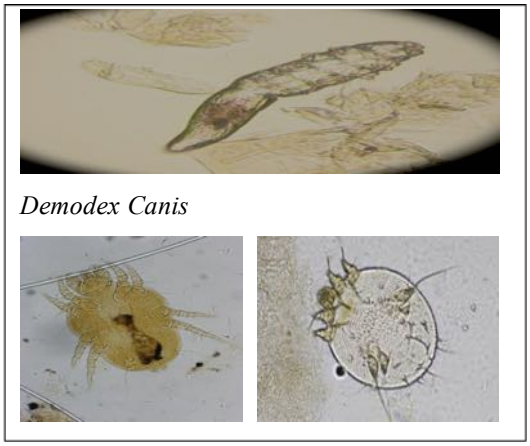


Fig 21: Different mites observed from skin scrapings



Demodex Canis

Psoroptes *Sarcoptes*

Rhizopus infected dog

Microsporum nanum affected dog

Tick identification

A couple of ticks were collected for identification from bovine and canine species. From the bovine, *Hemophysalis spp.* and *Boophilus spp*. were identified whereas from the canine *Hemophysalis spp. and Rhipicephalus spp*. were identified.

Boophilus spp.

Rhipecephalus spp.

Haemophysalis spp.

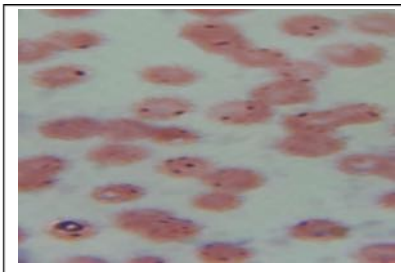
2.8.2 Hematology

A total of 273 blood samples were collected from animal patients of different species viz; canine, feline, bovine and equine. Out of the 273 samples, various tests were performed as given in (Table 22). During the examination of samples for blood parasites, *Anaplasma marginale* (22) and *Babesia spp.* (4) were observed. 80 serum samples were also collected for analyzing the biochemistry profile of the patients. From 2018-19, 11 numbers of Urinanalysis were carried out using the Urit-50 machine. Nine carcasses were referred to NCAH for conducting post mortem.

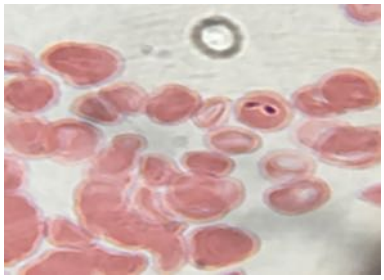
Table 22: Different tests at the hematology section

Tests	Number
Differential leucocyte count(DLC)	210
Heart Worm	12
Hemoglobin (Hb/dl) estimation	210
Blood parasite	36
Whole Blood referred for Culture at NCAH	12
serum sample for biochemistry analysis	80
Urinanalysis*	11
Postmortem*	9

*Urinanalysis and postmortem are clubbed under hematology since hematology section deals with these activities at the moment



Anaplasma marginale



Babesia spp.

2.9 Medicine utilization

A total of 9106 items of medicines were received during 2018-19 amounting to Nu. **4, 61,248/-** (Fig 22). At the end of June 2019, ***76.3%*** of medicines was used. Due to shortage of medicine in the hospital, some of the medicines were mobilized from other DVHs.

Only two vials of injection Sodium Bicarbonate expired ***(0.02%)*** from the last indent which amounts to **Nu.174/-** only. The reason for its expiry is due to minimum usage, as it is mostly used in large animals. The expiry rate for 2018-19 is significantly decreased compared to 2017-18, which was ***0.47%***.

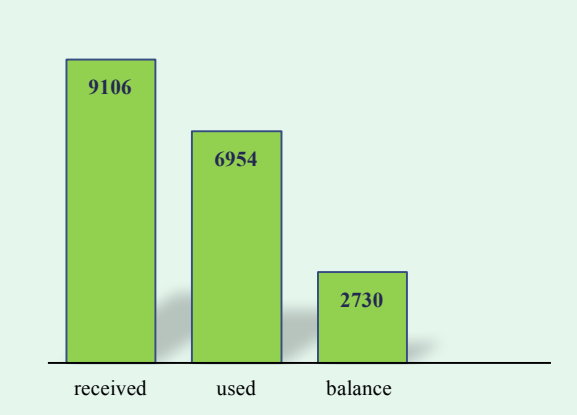


Fig 22: Total medicine received and used from July 2018 to June 2019.

Medicine use: The ten most utilized medicines/ non-medicines are summarized in the table 23. The usage pattern is as per the volume received against their usage. The hospital has faced shortages of live saving drugs such as hemostatic and anti-neoplastic drugs for past two years, even though the cases are frequently being encountered.

Table 23: 10 medicines which were mostly being used in 2018-19.

Sl. No	Medicine	Received	Used	% Used
1	B-Complex inj.	150	150	100
2	Benzathine Pencillin inj.	300	200	67
3	Cefotaxime inj.	120	150	125*
4	DNS	1000	850	85
5	Neuroxin inj.	295	255	86
6	Povidone iodine	420	270	64
7	Rectified spirit	56	51	91
8	Ringers Lactate (RL)	1310	1210	92
9	Strepto-pencillin inj.	120	100	83
10	Strepto-pencillin intramammary	240	240	100

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

Antibiotic use: Table 24 shows the top ten antibiotics used in the hospital from July 2018 to June 2019. Streptomycin inj. was mostly used (350 %) while Sulphadiazine + Trimethoprim had 0 % usage. Certain antibiotics like Cefotaxime (30 vials), Streptomycin (75 vials) and Enrofloxacin (19 vials) were arranged or mobilized from DVH, Samtse due to their shortages. Numerous mobilization from other centers, especially nearby Thimphu DVH were also done but not reflected in the report since records were not maintained.

Table 24: Most frequently used antibiotics at NVH in 2018-19

Antibiotic	**Qty received**	**Used**	**Balance**	**% Usage**
Amoxicillin trihydrate+Colistin sulphate	5	5	0	100
Amoxicillin trihydrate	48	28	20	58
Ampicillin + Cloxacillin inj.	113	73	40	65
Ampicillin inj.	10	10	0	100
Benzathin Pencillin inj.	300	200	100	67
Cefotaxime inj.	120	150	-30	125*
Cephalexin	10	3	7	30
Cephalexin	9	1	8	11
Enrofloxacin inj.	9	28	-19	311*
Enrofloxacin tab.	130	130	0	100
Gentamicin inj.	60	60	0	100
Metronidazole inj.	750	350	400	47
Metronidazole tab.	10	10	0	100
Oxytetracycline LA inj.	14	10	4	71
Oxytetracycline SA inj.	20	18	2	90
Streptomycin inj.	30	105	-75	350*
Sulphadizine bolus	10	5	5	50
Sulphadizine + Trimethoprim	5		5	0

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

2.10 Budget utilization

A total of Nu. 17.372m was approved for NVH during 2018-19 fiscal year. Nu. 16.545m was used and the balance amount was Nu.0.847m (Table 25 & annexure 2). The budget utilization percentage was 95.13 % (Table 25).

Table 25: Approved Budget for NVH, FY 2018-19 (Nu in million)

Sl. No	Title	Budget	Used	Balance
1	Personal emoluments	7.092	6.948	0.144
2	Operation and management services	2.955	2.662	0.293
3	Animal health- dog and cat population management and rabies control program	0.160	0.160	0.000
4	National pharmacovigilance center for veterinary services	0.315	0.298	0.170
5	Strengthening and enhancement of laboratory diagnostic services	0.220	0.209	0.011
6	Mobile clinic for Highlanders program	0.160	0.115	0.045
7	Construction of stable and management of Shetland ponies and Falabella	0.500	0.173	0.327
8	Procurement of furniture	1.478	1.468	0.010
9	Purchase of 1 utility vehicle (Isuzu)	3.222	3.221	0.001
	Total (Nu in M)	17.392	16.545	0.847
	Utilization %	**95.13%**		

2.11 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 71 clients filled the questionnaire and analysis was done on the Excel spreadsheet. For 2018-19, the CRS for NVH was calculated at 84.0%.

Questionnaire	Q1	Q2	Q3	Q4	Q5	average
Rating %	85.6	85.2	85.9	84.6	78.6	84.0

The highest rating was for Q3 (facilities) and lowest for Q5 (waiting time). The longer waiting time could be attributed to increasing number of cases each year coupled with inadequate staff to provide prompt services.

3. Unplanned activities

The unplanned/ ad-hoc activities are listed below as a summary (Table 26 & 27). 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

Table 26: In-country trainings/ workshops attended outside of the planned activities

Sl.no	Training/ workshop	Date	Venue	Person/s attended
1	Review of expiry of veterinary medicines	17-20/7/18	LCS, Pling	Dr. Jambay Dorji
2	Visit to Neetshel	23-25/7/19	Pling	Dr. Jambay Dori
3	CABC program organized by NDPM & RCP and RSPCA	19/7-15/8/18	Rumtoktok	Dr. Nima and Meena Mrs. Tshering Yangchen and Phuntsho Dema
4	DTAC meeting	8-11/8/18	Paro	Dr. Jambay Dorji
5	Inspection of Bhutan Animal Rescue Center (BARC)	2/8/18	Yusipang	Dr. Jambay Dorji
6	Verification of veterinary medicines and equipment at LCS	24-28/9/18	Phuentsholing	Dr. Nima Wangdi
7	Tender Evaluation of Veterinary Equipment	5-11/11/18	NCAH, Serbithang	Dr. Nima Wangdi
8	Develop Herd Health management guideline	5-12/12/18	Gelephu, Samtse	Dr. Jambay Dorji
9	4th National one health conference	19-21/12/18	Paro	Dr. Pema Tshewang
10	Training of Trainers on Wildlife rescue organized by NCD	25-27/1/19	Taba	Dr. Pema and Dr. Nima
11	DTAC meeting	3-4/2/19	Phuentsholing	Dr. Jambay Dorji
12	Workshop cum training on bacteriological tests organized by RLDC, Tsimasham	11-16/2/19	Phuentsholing	Mrs. Punya Mata
13	Stakeholder meeting on public services delivery	18-19/2/19	Thimphu	Dr. Pema Tshewang
14	HR conference	29-31/12/19	S/ Jongkhar	Mrs. Tula Maya
15	EVDP consultative meeting	3-6/3/19	Phuentsholing	Dr. Jambay Dorji
16	11th NVDC meeting	5-6/3/19	Phuentsholing	Dr. Kinley Dorji
17	National Pharmacovigilance committee meeting organized by DRA	26-28/3/19	Paro	Dr. Meena & Mrs. Tshering Yangchen
18	Sterilization campaign conducted by DVH, Thimphu	2-18/4/19	DVH, Rumtoktok	Dr. Meena & Dr. Nima

19	TOT workshop on usage of Laboratory information management system	10/4/19	NCAH, Serbithang	Mrs. Pema Tshomo Ms. Kinzang Pelden Mrs. Punya Mata
20	Bird flu outbreak control/ surveillance	16/4/19	Chukha	Ms. Kinzang Pelden Mrs. Punya Mata
21	Training workshop on human resource information system (HRIS)	22-23/4/19	RIM, Thimphu	Mrs. Tula Maya Ms. Ludup Pelmo
22	Verification of veterinary medicines and equipment	28/4/-1/5/19	Phuentsholing	Dr. Jambay Dorji
23	Incountry stepwise approach towards rabies elimination (SARE) assessment workshop	14-16/5/19	NVH, Thimphu	Dr. Meena Devi Samal
24	Finalization of Bhutan national formulary organized by DRA	14-17/6/19	Paro	Dr. Meena Devi Samal
25	36th DTAC	23-27/6/19	CNR, Lobeysa	Dr. Jambay Dorji
26	Tender evaluation of veterinary medicines and vaccines	20-30/6/19	NCAH, Serbithang	Dr. Nima Wangdi

Ex-country

Table 27: list of ex-country trainings/ workshops/ tours undertaken

Sl.no	Training/ workshop	Date	Venue	Person/s attended
1	2nd Regional workshop for veterinary education establishments (VEEs) and Veterinary statutory bodies (VSBs)	19-20/11/ 2018	Tokyo, Japan	Dr. Jambay Dorji
2	87th General Session of the world animal health assembly	23/5-3/6/19	Paris, France	Dr. Kinley Dorji
3	Training and extension at PTC*	28/5-20/7/19	Barneveld, Netherland	Mrs. Phuntsho Dema

*Training was availed through personal initiative of the staff

Internships

NVH serves as a perfect platform to develop the necessary knowledge and skills for the aspiring veterinarians and para-veterinarians who have just graduated. It eases the transition from being a student to entering the workforce with a sense of improved experience and self-confidence. NVH has received numerous interns who spent weeks to months in 2018-19.

As the part of the curriculum, the final year Diploma students of CNR visit NVH every year to get a hands on training on various theoretical aspects that they have learnt at the college. They are provided with trainings on receiving clients/ registration of cases, handling of patients, history taking, writing prescription, restraining of patients and providing treatments.

Table 28: Details of interns attached at NVH in 2018-19

Sl. No	Institution/ individual	Duration
1	Mr. Tashi Tenzin (BSc. Graduate)	3 months
2	Tshering Jimba (BSc. 1st year student, CNR)	1 month
3	Nidup Dorji (B.Sc. 2nd year student, CNR)	1 month
4	Tenzin Lhamo (B.Sc. 2nd year student, CNR)	2 weeks
5	CNR block week (39 Diploma final year students)	2 days
6	Dr. Dawa Yangka, Dr. Tshering Choden, Dr. Jamtsho, Dr. Kinzang Chedup (new vets)	1 week
7	Mr. Rechung Wangchuk (Student, Canada)	1 month

Visitors to NVH during 2018-19

NVH receives occasional visitors which are both formal and informal in nature. During 2018-19, NVH had following visitors (all foreigners).

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

Sl. No	Visitors	Remarks
1	Dr. Tabata Yuji and team (Japan Livestock Health care center)	Pet diets/ ivermectin 100ml bottle
2	Ms. Roatchana Sungthang (Country Director) & Mr. Naritsorn Pholpeem (Response Manager) World Animal Protection, Bangkok, Thailand	Informal
3	Dr. Katingka, FAO	Through AND, DoL
4	Dr. Gisle Sjoberg, Sweden (Clinical Database demonstration)	Informal
5	Elisa D. Harvey (Cardiomed device consultant)	Tourist
6	Dr. Earl Ellington (Pet emergency center, Missoula, USA	Tourist
7	Ms. Connie Siu, Director, Society for Abandoned animals and founder, animal med organization, Hongkong	Informal



Pictures: various visitors at NVH in 2018-19

Table 30: Donations received by NVH

Sl. No	Particulars	Donated by
1	1 Oxygen concentrator* 3 heaters 3 hot water bag	Aum Dorji Om Director, YDF
2	Books & surgical instruments**	Dr. Nicolette Hayward
3	Feed supplements (clinical diets for dogs)/ Ivermectin pour-on (100ml bottle)***	Japanese delegates




*Oxygen concentrator **Dr. Nic donating Surgical instruments and books ***Clinical diets for dogs

Job responsibilities/ focal persons for various services at NVH

For the smooth operations of various activities and efficient provision of services, focal persons were identified and appointed to take care of specific activities/ services at NVH (Table 32). 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.

Table 32: Identified Focal persons for various units/ services at NVH

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

Table 31: 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 and 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

4. Case studies

1. Surgical Management of Penetrating Wound in Equine

Nima Wangdi[1]

[1]Sr. Veterinary Officer, National Veterinary Hospital, Motithang, Thimphu

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Introduction

Penetrating injuries to a body cavity such as thorax or abdomen can be incurred from attempting to jump over a sharp fence, post or tree etc. Penetrating wounds into the thoracic and abdominal cavity are generally associated with a guarded prognosis due to pneumothorax and peritonitis or infection that sets in after injury. Penetrating trauma can be serious because it can damage internal organs and present a risk of shock and infection.

The severity of the injury varies widely depending upon the body parts (thorax or abdomen) involved, the characteristics of the penetrating object, and the amount of energy transmitted to the tissue. Assessment may involve X-rays or CT scans and treatment may involve surgery, for example to repair damaged structures or to remove the foreign objects.

Anamnesis

The case was reported to the National Veterinary Hospital (NVH) from Dechencholing at around 9:30 am on 22nd March 2019 through telephonic call. As per the history, the horse was chased by a pack of dogs sustaining injuries when trying to jump over a fence out of fright. A team comprising of a Veterinarian and a Para-veterinarian were sent to assist and provide necessary treatment.

Patient details

Species : Equine Sex: Male

Breed : Mule Age: Juvenile

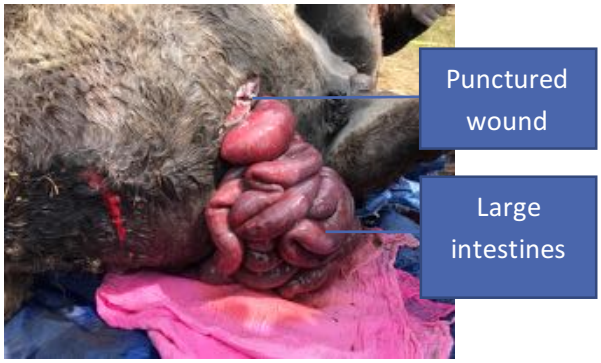
Observation

The RBG personnel rescued the injured horse and made the animal lie down on lateral recumbency to secure the eviscerating organs (large intestines) from soiling. The intestines were kept moist with the help of moist muslin cloth. The major observations were:

- Three penetrating wounds:

i. Wound measuring about 15cm towards left lateral aspect of the midline
ii. Small wound measuring about 10cm towards the right caudo-lateral aspect of the abdomen
iii. Penetrating injury at the Xiphoid region

- Evisceration of large portion of intestines
- Irregular edges of wounds
- Internal hemorrhages
- Intestinal trauma



Pic.1: Initial condition

Stabilization of the patient

The spilled out intestines were lavaged thoroughly with tap water followed by normal saline and returned to the abdomen as quickly as possible. The vital physiological parameters such as rectal temperature, SPO2, heart rate etc. were constantly monitored with a help of battery operated monitor (Maya foundation).

The animal was given with 1000 ml of RL, 900 ml D5 followed by NSAID, Phenylbutazone @ 4.4mg/kg bwt and cefotaxime @ 40mg/kg bwt.

Surgical Intervention

Xylazine at a dose rate of 0.5mg/kg bw in combination with ketamine 2.2mg/kg bw I/V was administered to sedate the mule.

The wounds were prepared aseptically followed by suturing of the peritoneum and the muscle. Finally, the skin was opposed using non-absorbable nylon suture material in simple interrupted and cross-mattress fashion.

A body bandage was applied to reduce the tension on the suture line (relapse minimized) and to render faster healing. The horse was then shifted to Paro for his follow up treatments.

Pic .2: After surgical correction

Pic .3: Post Surgery

2. Fracture of lower jaw (symphyseal separation)

Pema Tshewang[1]

[1]Dy. Chief Veterinary Officer, National Veterinary Hospital, Motithang, Thimphu

Introduction

The symphysis of the mandibles in the dog is considered a synarthrosis (immobile joint). It is a fibrous union between the left and right mandibles. The symphysis positions the left and right mandibles to provide substantial contribution for normal occlusion and it also allows flexibility to the lower jaws. Incidence of jaw fractures are quite common and accounts to about 1.5- 3% and 15- 23% of all fractures in case of dogs[1] and cats[2] respectively. The most common cause of jaw fractures in these animals is vehicular trauma.

The mandible is comprised of two bones joined on midline by a symphysis. The tooth roots, nerves, blood vessels, and salivary ducts are located within and adjacent to the mandible. These structures are frequently traumatized along with a mandibular fracture[1].

Various intervention methods are available depending upon the type of fracture. Healing of many jaw fractures, with the exception of certain pathologic dental disease fractures, is rapid[3]. Many are functionally healed in as little as two to three weeks with a reported average

healing time between 5.5 and 6.3 weeks[3].

Anamnesis

A free roaming adult male dog of mixed breed was rescued by passers-by and presented to the National Veterinary Hospital with a fractured lower jaw caused due to a vehicular accident. On examination, the lower mandibles were found to be separated at the symphysis, the tongue was dropping/ hanging in between the separated mandibles and the mouth was widely open (Pic 1). Apart from the associated discomfort and pain from the fracture, the animal was in a stable condition.

Pic 1: Symphyseal fracture

Diagnosis

Dental radiographs maybe helpful in the evaluation of the symphysis with an understanding of the local anatomy. However, some fractures are easy to diagnose with careful examination.
Symphyseal injuries are classified into three types as under:

Type 1 : Separation with no break in soft tissue.
Type 2 : Separation with a break in soft tissue.
Type 3 : Separation with a break in soft tissue and bone, or tooth fracture.
For this particular patient, radiography could not be taken due to technical problems with the machine, but the fracture was classified as Type 2 fracture based on the symptoms presented.

Treatment

The most important goal in jaw fracture repair is to allow the animal to eat comfortably, soon after repair[4]. It is also important to maintain normal occlusion. If either the upper or lower jaw heals in the wrong alignment (orientation), the patient may suffer from a malocclusion. Additionally; it is very important to avoid injury to tooth roots and the neurovascular (nerve and blood vessels) bundle within the mandibular or infraorbital canals[1]. Multiple methods of treating mandibular fractures are available. The type of fracture determines which method is most appropriate for the animal. There are basically two approaches to managing the mandibular fracture:

1. External immobilization:

External immobilization is usually achieved with the help of a muzzle, which could be either custom made or commercial. It entails manipulating the bone fragments into alignment to minimize discomfort through reduction of fracture segments. In some cases, external immobilization is all that is required for treatment.

2. Internal reduction:

Internal reduction involves stabilization using bone plates and screws and is a widely utilized surgical treatment. This entails making an incision in the region of the fracture and reducing (re-aligning) the fracture segments. One of the simplest methods of fixing symphyseal fractures is by using metallic suture wires to provide the necessary immobilization. It doesn't require sophisticated equipment and can be performed even without high level of expertise.

The patient was sedated with Xylazine @ 1mg/kg bw given IM. Xylazine alone had produced sufficient sedation and therefore, additional anesthetics were not required to be given. Contamination of fracture fragments with soil and blood clots were washed with NS solution and debridement done to remove dead tissues. A Surgical wire (stainless steel suture wire) was used in cerclage fashion by wrapping around at two places (site 1- around canine teeth of both side of lower jaw penetrating through the lower jaw muscle and skin; site 2- between first and second premolars penetrating through the lower jaw muscle and skin) to achieve immobilization and provide stability to the fractured jaw (Pic 2). The cerclage wires, were tightened by

twisting the two ends to form a loop at the end. The excess wires were cut off leaving about three full twists.

This is a simple and effective procedure with few drawbacks other than the accumulation of food particles between the wire and gum line and the accompanying gingivitis[1]. It has to be noted that this technique relies on the presence of stable teeth on either side of the fracture.

After the repair the animal was given injection meloxicam @ 0.2mg/kg bw SC for pain, injection Cefotaxime @25mg/kg bw bid IM for 7 days and injection B-complex @ 1ml IM for improving general body condition.

Aftercare

After the surgery, the animal was transferred to the inpatient ward for follow up treatment and observation. The animal had started eating towards the evening of the same day which had caused lodgment of food particles around the wire. Dry food and bones were replaced with soft diet to minimize stress on the healing bones and minimize trauma to the healing soft tissues within the mouth. Gentle flushing of the mouth was done on a regular basis to keep the mouth free of debris for faster healing. Due to discomfort and pain, the animal was observed pawing on the affected area. This had led to malocclusion and - loosening of the wire, therefore, an E-collar was put around its neck to prevent striking with its paws.

Pic 2: Immobilization of fracture segments with the help of stainless steel wires

Result

Prognosis is generally very good if complications are avoided[5]. The animal made an uneventful recovery and was able to eat food normally. After 45 days, the fracture segments had joined well so the wirings were removed. The animal was transferred to Jangsa animal shelter at Serbithang for further care and monitoring of its condition.

Conclusion

Due to increasing traffic and large stray dog population in the country, such cases are regularly being brought at the hospital. Even without advanced equipment and expertise, success of the intervention methods used will depend on the general understanding of the oral anatomy, choosing the appropriate method and dedicated aftercare.

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3. Management of femur fracture by intramedullary bone pinning in a dog

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Introduction

Femur is the most commonly fractured bone in dogs following substantial trauma. The fracture can be categorized as capital physeal, femoral neck, trochanteric, subtrochanteric, diaphyseal, supracondylar or condylar or distal physeal[1]. Most femur fractures are closed due to the heavy overlying muscle, unless the fracture is due to a penetrating injury. Femur fractures are generally not successful to conservative repair, and some kind of internal fixation is usually required. Some of the implants used for femur fracture repair include bone plates, interlocking nails, plate-rod construct, lag screws, pins and wires and external fixators. With the correct treatment, most fractures in dogs and cats can not only heal properly but also regain their normal functions[2].

The intramedullary pinning is the most secure method and gives fewer complications with second bone consolidation. All past cases of femur fracture of dogs and cats reported at NVH were managed by intramedullary pinning because using intramedullary pins is not only easy to use but also safe and economical[2].

Anamnesis

A young male dog (non-descript breed) about 11 months old was hit by a car and taken to the District Veterinary Hospital (DVH), Punakha on 23rd May 2019. During physical examination, it was confirmed that the dog had a fracture of femur on its right hind leg. The dog was referred to the National Veterinary Hospital at Motithang on 24th May 2019 for necessary treatment by the attending Veterinarian of Punakha DVH.

The dog was taken under NVH's care and kept at the inpatient ward. On examination, there was right femur fracture and the wound had been neatly sutured by the Veterinarian at Punakha DVH. A combined injection of analgesic and anti-inflammatory had also been given. The dog was very cooperative and wagging its tail throughout the time it was at the hospital. The dog was very docile and seemed quite resistant to the pain associated with the fracture trauma.

Diagnosis

Although it was relatively easy to palpate the limb to confirm the fracture, radiography of the leg was taken at the Army hospital at Lungtenphu to -

ascertain the extent of fracture. The radiograph showed that the dog had an oblique and displaced fracture with pointed fracture ends. Due to the injury from fractured ends on the muscles, the overlying muscles covering the femur were inflamed.

Fig1: Radiography image of the fractured femur

Surgical management

On the first day, the dog was provided with DNS fluid @ 200ml IV, injection Meloxicam@ 0.2mg/ kg bw IM and injection B-complex @ 0.7ml IM. An antibiotic course with injection Cefotaxime @ 20mg/kg bw IV was also initiated to prevent infection of the wound. On 25th May 2019, the animal was taken into the OT for bone pinning surgery. Injection Xylazine @ 1mg/kg bw IM was given as preanesthetic. After 10 minutes, combination of Ketamine @10mg/kg BW and Diazepam @ 0.2mg/ kg bw was given slowly through IV route for induction of anesthesia.

Hairs around the thigh area was shaved and the surgical site rendered aseptic with repeated cleaning and application of povidone iodine solution. The animal was transferred to the OT and after draping and connecting to multi-parameter monitor, the surgery was performed.

The skin was incised and underlying muscles surrounding the femur were separated to expose the fractured bones. The lower segment of the fracture end was retracted and small broken pieces of fractured bone removed. Both the sharp and pointed ends of the bones were cut

Pics 1 & 2: insertion of IM pin in the distal fracture segment and re-inserting upwards in the pin in the proximal fracture segment of the femur.

and made blunt to prevent poking of muscles. After the length of intramedullary (IM) pin insertion was measured, IM pin was inserted through the medullary cavity and drilled out through the distal epiphysis. The proximal part of the fracture end was held together with distal fracture end in alignment so that the IM pin could be pushed in through the medullary cavity upwards. Correct IM pin placement was confirmed by palpating the fingers through the length of the bone and by moving the pin. The muscles and skin were then sutured back in routine manner. The extra length of IM pin protruding out of the skin was cut till one cm from the skin (this was to ease the removal of the pin after the fracture had healed).

Postoperative care

Analgesic Meloxicam @ 0.2mg/kg bw IM and antibiotic injection Cefotaxime @ 20mg/kg bw IM was given for three and seven days respectively. The animal was limited to the inpatient ward room to restrict movement and unnecessary activity. Daily dressing of the wound was carried out with povidone iodine and gamma benzene ointment. An Elizabethan collar was secured on the neck to prevent licking of wound and the pin.

Result

One-week post-surgery, the animal was hopping and running around. Except for the mild discharges from the point of pin insertion, there was no complications whatsoever and the fracture had healed completely in a month's time. The non-absorbable skin sutures were removed in two weeks and the IM pin was removed after 45 days under sedation with Xylazine given @ 1mg/kg bw IM.

Pic 3: wound dressing after the surgery

Pic 4: E-collar to prevent licking of wound

Discussion

Intramedullary pinning acts primarily as internal splint of medullary canal of long bone, maintain axial alignment of the fracture and resists bending forces in all directions applied to the bone[1]. Moreover, the insertion of intramedullary pin promote bone healing by bringing in contact with the bone fragments, pluripotent cells derived from bone marrow[3]. Insertion of an intramedullary pin is basically un-physiological because it destroys the medullary blood supply and prevents formation of endosteal callus. However, it has been demonstrated that the marrow is

able to regenerate vascularisation after one week and to irrigate the bone cortex, with the exception of areas where it is in direct contact with the pin[4]. It has been reported that intramedullary pins are satisfactory for shaft fractures of the femur in small dogs and cats[5].

Conclusion

The femur fracture was successfully managed by application of intramedullary pinning and dedicated post-operative care. The animal made uneventful recovery and was fortunately adopted after it made full recovery.

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4. Anaplasmosis in dog

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Introduction

Canine Anaplasmosis is a tick borne disease caused by obligate, intracellular, gram negative bacteria called *Anaplasma phagocytophilum* and *Anaplasma platys*. Infection with *A. platys* results in cyclic thrombocytopenia and shows symptoms of bleeding disorders. During infection with *A. phagocytophilum*, the dog shows symptoms of lameness, joint pain, pyrexia, lethargy, anorexia, vomiting, diarrhea, coughing and rarely seizures. The dog can be infected with both organisms at the same time.

Anamnesis

A robust Samoyed named snowy, 4yrs old, was presented with the history of multiple dog bite wounds, lethargy and pyrexia. Before brining snowy to the hospital the family had done basic wound dressing for three days and snowy was taken for vacation to Gelephu before the incident.

Observation

Clinical examination:

- Rectal Temp: 105.7°F
- CMM: Congested,
- Purulent discharge from the wound.

Snowy was put on antibiotic (Enrofloxacin), antipyretic (Meloxicum) and ASD of wound was done. After three days of treatment additional symptoms were observed:

1) High colored urine
2) Polydipsia
3) Pitting swelling of the body, fore and hind limbs
4) subcutaneous hemorrhage
5) Vomiting
6) Anorexia
7) Pyrexia
8) Blanched CMM

Laboratory findings:

Blood sample was collected for hematological examination.

Following parameters were noted:

- mild Lymphocytosis
- thrombocytopenia and
- decreased Hemoglobin.

Blood smear examination showed presence of intracellular organisms inside the blood cells.

Urine analysis:

- Protenuria (+2)
- Bilirubineia (+3)

Ultrasonography exam:

Ultrasound imaging revealed cortical hyper echogenicity of Kidneys.

Treatment

Before the confirmation from the Laboratory, antibiotic was changed to OTC (SA) @10mg/kg, inj. Pantoprazole @ 0.5mg/kg and inj. Multivitamin was introduced and fluid therapy maintained. Blood transfusion was done form a healthy donor after performing basic cell agglutination test. The patient started to respond to the treatment. After confirmation of Anaplasmosis, Snowy was put on Doxycycline tablet @ 10mg/kg twice daily for one month.

Hematinic (RBC supplement) and Omega-3 fatty acid supplements (eg: fish oil) was advised to be given daily at home. The wounds following the sloughing of tissues with subcutaneous hemorrhage were dressed with silver wound dressing gel and metronidazole gel. After one month of treatment, Doxycycline course was further extended after microscopic examination of blood still revealed presence of the blood parasite.

Discussion

Detection of intracellular morulae in blood smear is highly specific but time consuming. This method is unreliable for all cases as the morulae are only evident during acute phase. Serological assays like IFAT and ELISA are used as confirmatory diagnosis for tick borne diseases, regardless of being highly sensitive but time and cost remains the limiting factor. ELISA rapid test kit like SNAP4Dx, are available which are now widely used for rapid confirmatory diagnosis.

Pic: Keratinized tissues following the healing of sloughed off tissue

Blood transfusion is critical and life-saving intervention in such cases. Dogs have 12 blood groups whereas cats have 4 blood groups. In case of unavailability of reagents/ facilities for cross matching of donor and recipient blood groups, first time blood transfusion can be done without any untoward reactions, however, for subsequent blood transfusion, determination of blood groups and cross matching is necessary to avoid adverse reactions. The donor blood must be screened for infectious diseases. Hence, having blood bank equipped with trained staffs and facilities is very important.

5. Annexure

Annexure 1.

Table 1: Various types of animal breeds brought at NVH

Dog breeds		
Apsoo	Alaskan Malamute	Alsatian/ German shepherd
Beagle	Basset Hound	Belgian shepherd
Boxer	Bull dog	Bull mastiff
Chihuahua	Cocker spaniel	Chow Chow
Doberman	Damtsi/ Tibetan spaniel	Dachshund
Dalmatian	Great Dane	Golden Retriever
Husky	Labrador	Local/ mongrel
Poodle	Pekingese	Pit Bull
Pomeranian	Pug	Maltese
Neapolitan mastiff	Rottweiler	Shih Tzu
Saint Bernard	Tibetan mastiff	Yorkshire Terrier
Cat breeds		
Local	Persian	Persian cross
Exotic/ other		
Pigeon	Sparrow	Owl
Guinea pig	Rabbit	

Persian kittens

Owl

Guinea Pig

Damtsi (Tibetan Spaniel)

Beagle

Pit Bull

Saint Bernard

Chow Chow

Labrador

Annexure 2:

Budget details for 2018-19

Printed Date: 25/07/2019

EXPENDITURE REPORT

4. REVISED BUDGET/EXPENDITURE

ADMINISTRATIVE UNIT: 204.01 MINISTRY OF AGRICULTURE & FORESTS

DEPARTMENT: 03 DEPARTMENT OF LIVESTOCK

FIELD OFFICE: 21 NATIONAL ANIMAL HOSPITAL, THIMPHU

(Nu. in Millions)

PRG	SPRG	ACT	SACT	FIC	OBC	TITLE	BUDGET	EXPENDITURE	BALANCE	%
045						LIVESTOCK SERVICES				
	027					LIVESTOCK HEALTH SERVICES				
		001				DIRECTION SERVICES (VETERINARY HOSPITAL)				
			01			PERSONNEL EMOLUMENTS (VET - HOSPITAL)				
				0001		BOOB Financing				
					01.01	Pay and Allowances	6.143	6.143	0.000	0.00
					02.01	Other Personnel Emoluments	0.385	0.276	0.108	28.18
					24.03	Contributions - Provident Fund	0.564	0.529	0.035	6.18
						TOTAL OF FIC 0001	7.092	6.948	0.144	
						TOTAL OF SACT 01	7.092	6.948	0.144	
			02			OPERATION AND MANAGMENT SERVICES				
				0001		BOOB Financing				
					11.01	Travel - Incountry	1.431	1.427	0.004	0.30
					12.01	Utilities - Telephones, Telex, Fax, E-mail, Internet	0.080	0.045	0.035	44.13
					12.02	Utilities -Telegram, Wireless Transmission, Postage	0.010	0.010	0.000	0.10
					12.03	Utilities - Electricity, Water, Sewerage	0.262	0.168	0.094	35.72
					14.01	S & M - Office Supplies, Printing, Publications	0.155	0.155	0.000	0.10
					14.02	S & M - Medicines & Laboratory Consumables	0.150	0.149	0.001	0.42
					14.05	S & M - Animal Feeds	0.100	0.099	0.001	0.66
					14.06	S & M - Uniforms, Extension Kits, Linens	0.085	0.083	0.002	2.14
					14.07	S & M - Text Books, Library Books, Stationeries & Sports Item				
					15.01	Maintenance of Property - Buildings	0.059	0.059		
					15.02	Maintenance of Property - Vehicles	0.371	0.370	0.001	0.25
					15.05	Maintenance of Property - Equipments	0.001	0.001	0.000	15.00
					15.07	Maintenance of Property - Computers	0.014	0.013	0.001	5.36
					17.01	Op. Exp. - Advertising	0.035	0.035		
					17.02	Op. Exp. - Taxes, Duties, Royalties, Fees, Handling Charges, Bank Charges	0.022	0.022	0.000	2.02
					18.01	Hospitality & Entertainment	0.030	0.026	0.004	12.70
					55.01	Professional Services	0.150		0.150	100.00
						TOTAL OF FIC 0001	2.955	2.662	0.293	
						TOTAL OF SACT 02	2.955	2.662	0.293	
			04			ANIMAL RELATED: DOG & CAT POPULATION MANAGMENT & RABIES CONTROL PROGRAM				
				0001		BOOB Financing				
					11.01	Travel - Incountry	0.159	0.159		
					14.02	S & M - Medicines & Laboratory Consumables				
					17.08	Op. Exp. - Incountry Meetings and Celebrations	0.001	0.001		
						TOTAL OF FIC 0001	0.160	0.160		
						TOTAL OF SACT 04	0.160	0.160		
			05			NATIONAL PHARMACOVIGILANCE CENTRE FOR VETERINARY				
				0001		BOOB Financing				
					11.01	Travel - Incountry	0.053	0.049	0.004	7.58
					14.01	S & M - Office Supplies, Printing, Publications	0.037	0.030	0.007	18.71
					17.08	Op. Exp. - Incountry Meetings and Celebrations	0.225	0.219	0.006	2.65
						TOTAL OF FIC 0001	0.315	0.298	0.017	
						TOTAL OF SACT 05	0.315	0.298	0.017	
			07			STRENGTHENING AND ENHANCEMENT OF LABORATORY DIAGNOSTIC SERVICES (MICROSCOPE AND DESKTOP FOR DIAGNOSTIC LAB.)				
				0001		BOOB Financing				
					14.02	S & M - Medicines & Laboratory Consumables	0.100	0.100		
					52.07	Plant & Equipt. - Hospital/Lab. Equipment	0.080	0.073	0.007	8.84
					54.03	Computers & Peripherals	0.040	0.036	0.004	10.25
						TOTAL OF FIC 0001	0.220	0.209	0.011	
						TOTAL OF SACT 07	0.220	0.209	0.011	

Page 1 of 2

ADMINISTRATIVE UNIT: 204.01 MINISTRY OF AGRICULTURE & FORESTS

DEPARTMENT: 05 DEPARTMENT OF LIVESTOCK

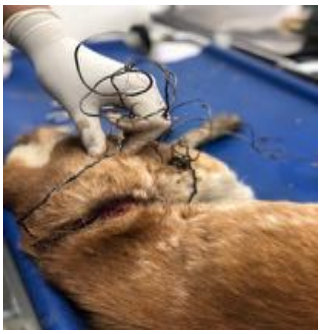
FIELD OFFICE: 21 NATIONAL ANIMAL HOSPITAL, THIMPHU

(Nu. in Millions)

PRG	SPRG	ACT	SACT	FIC	OBC	TITLE	BUDGET	EXPENDITURE	BALANCE	%
			08			MOBILE CLINIC FOR MOBILE HIGHLANDERS PROGRAM				
				0001		RGOB Financing				
					11.01	Travel - Incountry	0.100	0.055	0.045	45.18
					14.02	S & M - Medicines & Laboratory Consumables	0.020	0.020	0.000	0.39
					17.08	Op. Exp. - Incountry Meetings and Celebrations	0.040	0.040	0.000	0.22
						TOTAL OF FIC 0001	**0.160**	**0.115**	**0.045**	
						TOTAL OF SAct 08	**0.160**	**0.115**	**0.045**	
			09			PROCUREMENT OF FURNITURE				
				2027		Climate Change Adaptation in the Renewable Natural Resources Sector				
					54.01	Furniture	1.478	1.468	0.010	0.65
						TOTAL OF FIC 2027	**1.478**	**1.468**	**0.010**	
						TOTAL OF SAct 09	**1.478**	**1.468**	**0.010**	
			10			CONSTRUCTION OF STABLE AND MANAGEMENT OF SHETLAND PONIES AND FALABELLA				
				0001		RGOB Financing				
					14.02	S & M - Medicines & Laboratory Consumables	0.050	0.050		
					14.05	S & M - Animal Foods	0.150	0.123	0.027	17.81
					51.08	Exp. on Structure - Others	0.300		0.300	100.00
						TOTAL OF FIC 0001	**0.500**	**0.173**	**0.327**	
						TOTAL OF SAct 10	**0.500**	**0.173**	**0.327**	
			11			PURCHASE OF 1 UNIT UTILITY VEHICLE (ISUZU)				
				2027		Climate Change Adaptation in the Renewable Natural Resources Sector				
					53.01	Purchase of Vehicles	1.290	1.290		
						TOTAL OF FIC 2027	**1.290**	**1.290**		
						TOTAL OF SAct 11	**1.290**	**1.290**		
			12			PROCUREMENT OF 1 UNIT UTILITY VEHICLE (MOBILE VETERINARY CLINIC)				
				0001		RGOB Financing				
					53.01	Purchase of Vehicles	3.222	3.221	0.001	0.03
						TOTAL OF FIC 0001	**3.222**	**3.221**	**0.001**	
						TOTAL OF SAct 12	**3.222**	**3.221**	**0.001**	
						TOTAL OF Act 001	**17.392**	**16.545**	**0.847**	
						TOTAL OF SPrg 0177	**17.392**	**16.545**	**0.847**	
						TOTAL OF Prg 0469	**17.392**	**16.545**	**0.847**	
						TOTAL OF HQ 71	**17.392**	**16.545**	**0.847**	
						TOTAL OF Dept 05	**17.392**	**16.545**	**0.847**	
						TOTAL OF AU 204.01	**17.392**	**16.545**	**0.847**	
						GRAND TOTAL	**17.392**	**16.545**	**0.847**	

Annexure 3: Photo Album for 2018-29.

Sediment in urinary bladder



A dog Caught in a snare

A Vicenarian

Cherry eye

Evacuating urinary blockage

Aspiration of ascitic fluid

Hydrocephalic dog

X-ray image of hydrocephalus

Ascitic dog (enlarged abdomen)

Restraining a sick horse

Rescue of stray bull

SOP Training program

Oxygen supplementation

Surgery on a bear

Attending international meetings

TASHI DELEK PHUENSUM TSHOK!