PVS Pathway

OIE PVS Evaluation Mission Report

India

Human, Physical and Financial Resources

Technical Authority and Capability

Interaction with Interested Parties

Access to Markets

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Dr John Weaver (TL)
Drs Howard Batho, Susanne Münstermann, John Woodford

WORLD ORGANISATION FOR ANIMAL HEALTH
Protecting animals, preserving our future

OIE PVS EVALUATION

REPORT OF THE

VETERINARY SERVICES OF

INDIA

20 February to 9 March
&
11 April to 2 May 2018

Dr John Weaver (Team Leader)

Drs Howard Batho, Susanne Münstermann, John Woodford
(Technical Experts)

Drs Caitlin Holley, John Stratton
(OIE Observers)

World Organisation for Animal Health
12, rue de Prony
F-75017 Paris, FRANCE

Table of contents

List of acronyms, abbreviations and/or special terms

ABC	Animal Birth Control
ADMAS	Animal diseases monitoring and surveillance programme
AHC	Animal Husbandry Commissioner
AHD	Animal Husbandry Department
AI	Artificial Insemination
AIC	Artificial Insemination Centre
APEDA	Agricultural and Processed Food Products Export Development Authority
ASCAD	Assistance to States for the Control of Animal Diseases
ASEAN	Association of Southeast Asian Nations
AQCS	Animal Quarantine and Certification Services
AWBI	Animal Welfare Board of India
BE	Budget Estimate
BIPs	Border Inspection Posts
BRICS	Brazil, Russia, India, China and South Africa.
BSE	Bovine Spongiform Encephalopathy
BSL	Bio Safety Level
BQ	Black Quarter
BVSc&AH	Bachelor of Veterinary Science & Animal Husbandry
BVD	Bovine Viral Diarrhoea
CADRAD	Centre for Animal Disease Research and Diagnosis
CAE	Caprine Arthritis/Encephalitis
CAPEXIL	Chemicals & Allied Products Exports Promotion Council
CBPP	Contagious Bovine Pleuropneumonia
CCHF	Crimean-Congo Haemorrhagic Fever
CCSNIAH	Chaudhary Charan Singh National Institute of Animal Health
CDDL	Central Disease Diagnosis Laboratory
CDIO	Chief Disease Investigation Office, Trivandrum
CDSCO	Central Drugs Standard Control Organisation
CE	Continuing Education
CFSPTI	Central Frozen Semen Production and Training Institute
CGDISSA	Chhattisgarh Disease Investigation Information System for Animals
CHRS	Central Herd Registration Scheme
CIRB	Central Institute for Research on Buffaloes
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMVL	Central Military Veterinary Laboratory
COHEART	Centre for One Health Education, Advocacy, Research and Training
CP	Control Programme
CPCSEA	Committee for the Purpose of Control and Supervision of Experiments on Animals
CPDO	Central Poultry Development Organisation
CSF	Classical Swine Fever
CSIR	Council of Scientific and Industrial Research

CSS	Centrally Sponsored Scheme
CVO	Chief Veterinary Officer
DADF	Department of Animal Husbandry, Dairying and Fisheries
DARE	Department of Agriculture and Research and Education
DBT	Department of Biotechnology
DDL	Disease diagnostic laboratory
DG	Director General
DGFT	Directorate General of Foreign Trade
DoACFW	Department of Agriculture Cooperation and Farmers Welfare
DSPC	Delhi Society for the Prevention of Cruelty to Animals
DST	Department of Science and Technology
EDFZ	Equine disease free zone
EI	Eqiune Influenza
EIA	Export Inspection Agency
EIC	Export Inspection Council
EMRI	Emergency Management and Research Institute
ESBL	Extended Spectrum β-Lactamase
ESVHD	Establishing and Strengthening of Veterinary Hospitals and Dispensaries
EU	European Union
FAO	Food and Agriculture Organisation
FIAPO	Federation of Indian Animal Protection Organisations
FMD	Foot and Mouth Disease
FMD-CP	Foot and Mouth Disease Control Programme
FSSAI	Food Safety Standards Authority of India
GIS	Geographical Information System
GoI	Government of India
GLP	Good Laboratory Practice
GMP	Good Manufacturing Practice
GVK	Gunupati Venkata Krishna
HSADL	High Security Animal Disease Laboratory
HPAI	Highly Pathogenic Avian Influenza
HP	Himachal Pradesh
HPLC	High Performance Liquid Chromatography
HQ	Headquarters
HS	Haemorrhagic Septicaemia
IAS	Indian Administrative Service
IBD	Infectious Bursal Disease
IBR	Infectious Bovine Rhinotracheitis
ICAR	Indian Council for Agricultural Research
ICFMD	International Centre for Foot & Mouth Disease
ICMR	Indian Council of Medical Research
ID	Individual Identification
IDSP	Integrated Disease Surveillance Programme
IEC	Information, Education and Communication
INAPH	Information Network for Animal Productivity and Health
INR	Indian Rupee

IPC	Indian Pharmacopoeia Commission
ISO	International Standards Organisation
IVRI	Indian Veterinary Research Institute
km	Kilometre
LAMP	Loop mediated isothermal amplification
LDB	Livestock Development Board
LH&DC	Livestock Health and Disease Control
LIMS	Laboratory Information and Management System
MCF	Malignant Catarrhal Fever
MFPI	Ministry of Food Processing Industries
MoA&FW	Ministry of Agriculture and Farmers Welfare
MoEFCC	Ministry of Environment, Forestry and Climate Change
MoH&FW	Ministry of Health and Family Welfare
MoU	Memorandum of Understanding
MoCI	Ministry of Commerce and Industry
MST	Ministry of Science and Technology
MSVER	Minimum Standards of Veterinary Education Regulations
NABL	National Accreditation Board for Testing & Calibration Laboratories
NADRES	National Animal Disease Referral Expert System
NADRS	National Animal Disease Reporting System
NSD	Nairobi Sheep Disease
NCDC	National Centre for Disease Control
ND	Newcastle Disease
NDDB	National Dairy Development Board
NDP	National Dairy Plan
NGO	Non Governmental Organisation
NIC	National Information Centre
NIHSAD	National Institute of High Security Animal Diseases
NIVEDI	National Institute for Veterinary Epidemiology and Disease Informatics
NPDD	National Programme for dairy development
NRCE	National Research Centre on Equines
NRCP	National Rabies Control Programme
NOC	No Objection Certificate
NSA	Non State Actors
OIE	World Organisation for Animal Health
OVS	Official Veterinary Surgeon
PCA	Prevention of Cruelty to Animals
PCR	Polymerase Chain Reaction
PED	Professional Efficiency Development
PEP	Post exposure prophylaxis
PPP	Public Private Partnership
PPR	Peste des petits ruminants
PRRS	Porcine reproductive and respiratory syndrome
RHD	Rabbit Haemorrhagic Disease
RDDL	Regional Disease Diagnosis Laboratory
RFS	Regional Fodder Station

RKVY	Rashtriya Krishi Vikas Yojana
RRC	Regional Reference Centres
RP	Rinderpest
RRT	Rapid Response Team
RVC	Remount and Veterinary Corps
RVF	Rift Valley Fever
RVS	Remount and Veterinary Services
S&T	Ministry of Science and Technology (also MST)
SAARC	South Asian Association for Regional Cooperation
SADEC	State Animal Disease Emergency Control
SCBP	State Cattle Breeding Program
SDDL	State Disease Diagnostic Laboratory
SPCA	Society for the Prevention of Cruelty to Animals
SO	Statutory Order
SOPs	Standard Operating Procedures
SPS	Sanitary and Phytosanitary
SV	Vesicular Stomatitis
TAHC	Terrestrial Animal Health Code
TB	Tuberculosis
TRACES	Trade Control and Expert System (of the EU)
USD	United States Dollar
UT	Union Territory
VCI	Veterinary Council of India
VMP	Veterinary Medical Products
VS	Veterinary Services
VSB	Veterinary Statutory Body
WII	Wildlife Institute of India
WTO	World Trade Organization

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The conduct of this PVS Evaluation by Dr John Weaver (Team Leader), Dr Howard Batho, Dr Susanne Münstermann and Dr John Woodford (Technical Experts), hereinafter called the PVS Evaluation Team, has been formally authorised by the OIE. The support provided by OIE of this mission is acknowledged with thanks.

The OIE PVS Evaluation of India was an enormously complex task given the size of the country, its very large and extensive livestock industries, its well developed Veterinary Services (VS) and its culture of respecting animals. The mission was only made possible by the support of many people.

The PVS Evaluation Team wishes to express its thanks to the Minister of State for Agriculture Smt. Krishna Raj for her leadership and her ongoing support of the animal health services in India and to the OIE PVS mission.

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The teams were accompanied by many DADF and state veterinarians and other staff during their many visits and their support, time and patience in answering many questions is gratefully acknowledged – we apologise for our many questions and requests for additional information and materials; this was not intended to be critical but merely to enhance our understanding of certain aspects of the complex and well-developed India VS. A list of places visited and the people we met is attached as Appendix 3 – thank you everyone.

Thank you all for making our mission such a success and making our visit to your wonderful country so enjoyable.

John Weaver, Howard Batho, Susanne Münstermann, John Woodford, John Stratton & Caitlin Holley

PART I: EXECUTIVE SUMMARY

I.1 Introduction

Following a request to the OIE from the Government of India, an evaluation of the Veterinary Services (VS) based on the OIE PVS (Performance of Veterinary Services) methodology was conducted in two missions from 19 February – 9 March 2018 and from 11 April – 2 May 2018 by a team of four independent OIE certified PVS evaluators.

It should be noted that the OIE PVS Evaluation was an assessment of the national Veterinary Services (VS) of India and not of the sub-national state programmes. Many states expressed an interest in receiving direct feedback on the findings in their jurisdictions but this level of evaluation was not possible during the mission to India. It is strongly recommended that the national evaluation undertaken by independent OIE experts is followed up by assessment of individual state veterinary services, such as via PVS self-evaluation.

The evaluation began with a brief opening meeting at DADF, in the Ministry of Agriculture and Farmer's Welfare (MoA&FW) headquarters in Delhi, facilitated by the mission lead contact; senior staff were not available owing to a clash of activities. Given the lack of senior staff being available the mission in two teams immediately set out on visits to the southern states of India. At the end of Mission 1 meetings were held with the senior staff of DADF including the Secretary, Joint Secretary and Animal Husbandry Commissioner; also at this time meetings were held with other Competent Agencies, particularly the Ministry of Health and Family Welfare (MoH&FW) and the Ministry of Environment, Forest and Climate Change (MoEFCC). Mission 2 began with the OIE-PVS Team Members meeting with the Honourable Minister of State, DADF, Smt. Krishna Raj, and was followed by further meetings being held in Delhi with DADF staff and visits to the northern and north-eastern states of India. The mission visited sites and institutions across the country in both the public and private sectors. Discussions were held with government officials, public and private sector veterinarians, livestock producers, traders, consumers and other stakeholders.

The mission concluded with a closing meeting, held at DADF and attended by the Secretary and Joint Secretary and other officers, at which the overall findings of the evaluation were presented.

I.2 Key findings of the evaluation

I.2.A Human, physical and financial resources

The VS of India have a very large, competent and professional staff of veterinarians, veterinary para-professionals and other highly qualified specialists in appropriate positions – such as in laboratories and research.

Sufficient veterinarians are employed by central and state governments to conduct the baseline operations of the VS. However, there are insufficient veterinarians operating at the field level to supervise the large numbers of veterinary para-professionals and other, less trained animal health technicians to deliver effective disease surveillance, disease control and food safety programmes. At DADF and in many states there are significant vacancies against 'sanctioned' positions, some at senior director levels, and this compromises efficient and effective technical decision making and programme delivery.

A further limitation of the VS is the lack of the appropriate technical specialists required to achieve effective programme design and delivery; there is a notable weakness in

skills in epidemiology, risk analysis and food safety. In part as a consequence of this situation, there is inadequate monitoring, evaluation and review of the VS programmes.

Indian veterinary universities and colleges follow an agreed national curriculum and are monitored and approved by the Veterinary Council of India. In general basic OIE 'Day 1' competencies are achieved; there are some colleges that have had some problems and these have been suspended and the problems are being addressed. Veterinary para-professionals are trained at a number of training centres; their basic training is good. India has been in the forefront of developing standards for veterinary para-professionals and this is acknowledged. However, short course trained workers such as the gopal mitras, are trained only in artificial insemination, but were reported to be also undertaking unsupervised animal health diagnosis and treatment.

Funding for the VS has been stable over time and recently has seen a significant improvement. Operating budgets allow for baseline activities and the implementation of a number of major programmes such as Assistance to the States for the Control of Animal Diseases (ASCAD) but only limited budget is set aside for repairs and maintenance and more is required to upgrade the many facilities that are currently in a poor state of repair. This is acknowledged and is being addressed by the specialist Establishment and Strengthening of Veterinary Hospitals and Dispensaries (ESVHD) programme which is providing significant large scale capital investment to build new facilities and purchase new equipment. The major investment in the International Centre for Foot and Mouth Disease (ICFMD) is significant.

Emergency funding arrangements are well established and are 'in use' for the recurring Highly Pathogenic Avian Influenza (HPAI) outbreaks. There is currently no financial support from industry and this situation might be reviewed.

There is considerable documentation and reporting of the monitoring of operations and programme delivery but little critical analysis and review being undertaken.

Coordination and management of the VS is generally strong with excellent 'internal' coordination between the DADF and state Animal Health Departments (AHDs) and with India Council for Agricultural Research (ICAR), the veterinary schools and other institutes.

'External' coordination between the VS and other ministries and competent authorities is more variable but is generally good at the central level with formal and informal communications and the successful development of some joint programmes. At state levels coordination with other government sectors and agencies is more mixed with some states having robust programmes of coordination, joint programme design and delivery but others much less so. There is an opportunity for animal and human health services to work more closely together to better address food safety, antimicrobial resistance and the control of major zoonoses such as rabies.

The VS have good stability of policies and programmes with increasing resources being provided. Organisational structures and staffing are stable allowing for sustainable programmes; as indicated previously there are concerns over the inability to effectively manage and deliver expanded programmes with the current staffing levels.

Full technical independence, i.e. decisions based purely on science, is impossible to achieve in any political, economic and social environment. The India VS generally have a high level of technical independence with no undue changing of policies based on non-scientific considerations.

I.2.B Technical authority and capability

The technical capabilities of the India VS in many activity areas are high; however, there are a number of areas where considerable strengthening should be considered.

India has a national network of veterinary diagnostic laboratories with an appropriate hierarchy of capabilities; the diagnostic laboratories are well supported by the ICAR research and diagnostic laboratories and other specialist centres. The individual laboratory facilities and diagnostic capabilities are generally of a high and appropriate standard. A number of laboratories are internationally recognised as reference laboratories and centres of expertise. Laboratories are well-used with a good throughput of samples; however, there is a need for more quality assurance and accreditation. The use of risk analysis and the border control of imported livestock and animal products is effective at airports and major seaports. There is minimal control of the extensive land borders with evidence of disease incursions occurring. The quarantine stations, used only for managing imports by sea and air, have good facilities and are well managed and effective.

The animal disease surveillance programme seeks to detect disease outbreaks, to monitor disease control programmes and to demonstrate disease freedom. The programme is extensive and well supported by the network of field VS and laboratory testing. There are a number of gaps and limitations to the surveillance programme – some of these are being addressed but issues remain. Major concerns, that are not uniform state by state, are the lack of comprehensive field coverage especially in more remote and tribal areas, the lack of routine differential diagnostic testing of key syndromes (e.g. for foot and mouth disease (FMD) and highly pathogenic avian influenza (HPAI), the lack of sound outbreak investigations with identification of risk factors and tracing, and the limitations of the National Animal Disease Recording System (NADRS). Active surveillance to monitor disease control programmes is undertaken using random sampling; test and re-test programmes are limited by the lack of animal identification. There is good engagement with the wildlife sector and cooperation in joint programmes. There is minimal surveillance activity at both slaughter facilities and livestock markets – useful aggregation points for disease detection and risk management.

Disease control and eradication programmes have been expanded in recent years so that many are now national rather than focused on a few states or regions. Good progress has been made in disease control against priority diseases such as FMD and peste de petits ruminants (PPR). There is a tendency to be overly dependent on vaccination and not to adequately address other supporting control measures such as public awareness, movement control and improved biosecurity; to confound progress further vaccine is often not available in sufficient quantities. A further challenge to disease in cattle is the inability to cull animals with disease (e.g. FMD, brucellosis) in spite of the legal mandate, this limits control options and makes their isolation and management more critical; the gaushalas sometimes undertake this role but not universally.

Emergency preparedness and response systems have been well tested by repeated outbreaks of HPAI which have been successfully controlled. The ongoing glanders outbreak is widespread and proving difficult to control. Currently compensation is only paid for horses (glanders) poultry (HPAI) and pigs (PRRS) and this presents a risk if other emergency diseases occur.

Food safety at export and the major national and municipal slaughterhouses is well handled. Smaller slaughterhouses are more variable and generally need to upgrade their facilities and management systems. Most animal slaughter is uncontrolled with informal slaughter at locations with no or minimal facilities with no veterinary

supervision or meat inspection. In some locations good facilities have been built but are not being used as legislative measures are not enforced and protracted negotiations with butchers are required to change from their traditional business operations. There is some registration of 'chicken shops' and levels of facilities and inspections vary but are usually minimal. There is some residue testing by the Food Safety and Standards Authority of India (FSSAI) and some additional pilots are being undertaken by DADF and ICAR.

The registration and market authorisation of veterinary medicines and biologicals is well controlled. However, there are a number of concerns about the lack of prudent use with high-end antimicrobials being used for routine treatments, the lack of supervision of veterinary para-professionals and the use of veterinary medicines by gopal mitras, and other private sector animal health technicians.

Animal welfare is an important cultural and political imperative in India. Legislation has been in place for many years and the overall animal welfare programme is run through a statutory body – the Animal Welfare Board of India (AWBI) with little direct involvement of the VS in the field. In many sectors animal care is exemplary with a range of services caring for stray dogs, debilitated horses and other animals. The need to care for cattle is evidenced by the network of gaushalas across much of the country where great care is taken to protect and preserve cattle that are no longer productive. The management of cattle in the gaushalas and elsewhere does create welfare concerns when debilitated, moribund or diseased animals are kept alive resulting in suffering and the risk of further disease spread in spite of it being legal to euthanase animals. Other animal welfare concerns are the management of animal transport and slaughter – both areas need greater control to reduce animal stress and cruelty.

An important aspect of managing animal and veterinary public health programmes is the ability to trace animals and animal products through the supply chain. This capability does not yet exist in India. Some states are seeking recognition as free of specific diseases, such as FMD, and this requires the management of animal movements and other vectors of FMD into the state – there are a number of inter-state border check points but these are not effectively controlling animal/animal product/infected article movements.

I.2.C Interaction with interested parties

DADF and the state AHDs have well established communications using various media, including effective websites and social media. Consultations with the private sector are more variable with regular discussions with some industry groups nationally but with few representative producer organisations at state or national levels. Discussions and focus group meetings are held frequently at local levels.

There is very little delegation to the private sector by the VS. Some states contract private sector companies to deliver additional field veterinary services particularly to remote and tribal areas, work with the private sector to deliver the emergency call services ('1962') and some private laboratories are used to support testing. NGOs have a significant role in the delivery of some animal health and welfare services.

The Veterinary Council of India (VCI), with the supporting State Veterinary Councils, has been long-established and is an effective regulatory Veterinary Statutory Body for India. The VCI has established Day 1 competencies for veterinarians with a national curriculum and accredits undergraduate veterinary universities and colleges; post-graduate veterinary education is provided under the guidance by ICAR. The autonomy of the VCI is compromised by an over-dependence on government funding and the number of government members on Council.

The Indian VS have limited participation and contribution to international animal health meetings, policies, standards and issues, particularly given their size and influence and their strong technical capacity. India is strongly engaged with Codex Alimentarius.

I.2.D Access to markets

India has extensive legislation covering most aspects of the veterinary domain. There are a number of gaps that need to be addressed and aspects of the legislation that need updating. Some states have enacted their own legislation as required by the Indian Acts while others have not and the same legislation differs between states. Some legislation lacks detailed technical requirements. Some fee and fine schedules set down in legislation are badly out of date.

For a number of areas of the veterinary domain legislation is provided under a Competent Authority, mostly MoH&FW and MoEFCC. DADF do try to amend their legislation following new standards when necessary. FSSAI stated that there is an on-going demand for review of these standards taking into account new specifications and requirements. They review India's standards and harmonise them with the Codex and other international best practices to the extent possible and necessary taking into account their needs.

There is limited communication on legislation and what is required and minimal enforcement of compliance with regulations. There are particular concerns over the limited compliance of the sale of veterinary medicines at pharmacies and the movement of animals both in India to markets and slaughterhouses and across international land borders in both directions. There are no consolidated reports on compliance activities and so no cycle of assessing risk and targeting compliance activities.

Export certification is very well developed and works well. Having five (AQCS, APEDA, EIC, CAPEXIL and DGFT) different bodies responsible to cover all export areas of the veterinary domain is confusing especially when they cover some of the same items. Export certification is conducted in a transparent manner, respecting the requirements of importing countries and in accordance with international norms, using OIE standard international veterinary certification forms. No internal audits of the export certification system are carried out.

'Sanitary agreements' have been signed with a number of countries recognising the compartmentalisation of poultry, a disease free zone for horses and matching requirements and health certification for the import of animals and animal products.

India has developed proposals for three states to be recognised as FMD-free and formal proposals have been submitted to OIE. These proposals have not been endorsed and are undergoing continuing review and revision. Some countries have informally recognised some buffalo meat as being produced from FMD-free areas. There are currently 28 disease-free, high-health poultry compartments accepted by trading partners – India is one of a few countries where such compartments have been recognised.

Table 1: Summary of OIE PVS evaluation results

PVS summary results of India	Result
I. HUMAN, PHYSICAL AND FINANCIAL RESOURCES	
I.1.A. Staffing: Veterinarians and other professionals	4
I.1.B. Staffing: Veterinary paraprofessionals and other technical personnel	3
I.2.A. Professional competencies of veterinarians	2
I.2.B. Competencies of veterinary paraprofessionals	2
I-3. Continuing education	2
I-4. Technical independence	3
I-5. Stability of structures and sustainability of policies	4
I-6.A. Internal coordination (chain of command)	4
I-6.B. External coordination	3
I-7. Physical resources	3
I-8. Operational funding	4
I-9. Emergency funding	5
I-10. Capital investment	4
I-11. Management of resources and operations	2
II. TECHNICAL AUTHORITY AND CAPABILITY	
II-1.A. Access to veterinary laboratory diagnosis	4
II-1.B. Suitability of national laboratory infrastructures	3
II-2. Laboratory quality assurance	2
II-3. Risk analysis	2
II-4. Quarantine and border security	2
II-5.A. Passive epidemiological surveillance	3
II-5.B. Active epidemiological surveillance	4
II-6. Emergency response	4
II-7. Disease prevention, control and eradication	3
II-8.A. Regulation, authorisation and inspection of establishments	2
II-8.B. Ante and post mortem inspection	3
II-8.C. Inspection of collection, processing and distribution	2
II-9. Veterinary medicines and biologicals	3
II-10. Residue testing	2
II-11. Animal feed safety	1
II-12.A. Animal identification and movement control	3
II-12.B. Identification and traceability of animal products	3
II-13. Animal welfare	3
III. INTERACTION WITH INTERESTED PARTIES	
III-1. Communications	3
III-2. Consultation with interested parties	4
III-3. Official representation	2
III-4. Accreditation/authorisation/delegation	3
III-5.A. Veterinary Statutory Body Authority	3
III-5.B. Veterinary Statutory Body Capacity	2
III-6. Participation of producers and other interested parties in joint programmes	4
IV. ACCESS TO MARKETS	
IV-1. Preparation of legislation and regulations	3
IV-2. Implementation of legislation and regulations and compliance thereof	1
IV-3. International harmonisation	3
IV-4. International certification	4
IV-5. Equivalence and other types of sanitary agreements	3
IV-6. Transparency	3
IV-7. Zoning	4
IV-8. Compartmentalisation	5

I.3 Key recommendations

Key recommendations are provided here however for more detail the reader should review the main body of the report in which recommendations are made under each Critical Competency.

I.3.A Human, physical and financial resource

- ***Human resources***
  - Review the very large human resources of the VS considering the number of veterinarians, veterinary para-professionals and animal technicians, against the current and predicted requirements by role, competency and location.
  - Address the significant number of vacancies against 'sanctioned positions' – the actual need and tasks to be undertaken need to be considered against a long term vision of the VS and any vacancies filled.
  - Improve staff competencies and capabilities through a formal continuing professional development programme. Such a programme should focus on core skills that are currently weak or absent in the VS such as epidemiology, risk analysis and food safety. Continuing education should be made mandatory for re-registration by the VCI.
  - Introduce a merit-based system for promotion of veterinarians and other staff to ensure technical skills are well recognised, as well as used effectively and efficiently.
  - Review and define the roles of veterinary para-professionals and other personnel providing animal health services; implement training and registration to match the defined roles. Ensure all veterinary para-professionals and others are routinely and effectively supervised by veterinarians.
- ***Management and coordination***
  - Implement rigorous independent evaluation of programmes and their effectiveness and efficiency with a focus on outcomes and not on merely reporting activities undertaken – include economic analysis.
  - Review the organisation of the VS at central and state levels to ensure high level technical input from veterinarians.
  - Strengthen coordination with other ministries and 'Competent Authorities' both at national and state levels, to develop effective policies and programmes. Priorities are:
    - To effectively combat zoonoses, particularly rabies – with a greater emphasis on its surveillance and control in dogs and less on post exposure prophylaxis in people;
    - To improve the safety of foods of animal origin;
    - To improve the risk management of antimicrobial usage and resistance (AMU/AMR);
    - To ensure an improved implementation of animal welfare legislation.

➢ ***Financial and physical resources***

- Develop longer term budgets and funding for upgrades and routine repairs and maintenance of facilities and equipment; continue to invest in ESVHD and other supporting initiatives.
- Upgrade computer/internet access to facilitate NADRS; continue to develop the functionality of NADRS to meet the needs of the national VS, particularly programme monitoring and review.
- Promote emergency preparedness by funding the development of additional contingency plans and simulation exercise trainings. Review and extend compensation for diseases beyond HPAI and glanders.

I.3.B Technical authority and capability

➢ ***Laboratories***

- Review and upgrade, as necessary, the facilities, equipment and staff training at state and local laboratories (already underway in some states).
- Introduce electronic 'Laboratory Information Management Systems (LIMS) in all laboratories.
- Develop formal quality assurance programmes at levels appropriate for each laboratory – ISO 17025/NABL for the specialist and major diagnostic centres (C/RDDLs and SDDLs) and documented procedures for all lower level laboratories.
- Promote biosecurity/biosafety in all laboratories.

➢ ***Risk analysis & quarantine***

- Establish risk analysis units with trained epidemiologists, economists and other specialists as required at central and state levels. These units should critically review the risks associated with disease detection/failure to detect, the finite resources available for disease prevention and control, and the mitigation of risk to human health as priorities.
- Introduce effective border control at all land borders prioritising major routes; develop awareness and risk mitigation programmes for cross border movement of animals.

➢ ***Disease surveillance and control***

- Critically review the disease surveillance and disease prevention/control programmes and introduce more effective and efficient programmes with ongoing monitoring and evaluation and revision. The value of surveillance at aggregation points such as markets and slaughterhouses should not be overlooked.
- Address the limitations in disease surveillance and control caused by gaps in the field veterinary service, over-reliance on veterinary para-professionals, insufficient diagnostic testing (with differential diagnostic testing not merely 'rule outs'), poor field epidemiological investigation of outbreaks and their risk factors (including tracing), over dependence on vaccination (and not sufficiently reducing risk through awareness, biosecurity and movement control) and the limitations of NADRS/ADMAS with the lack of detailed review and sensitivity analysis to highlight weaknesses and opportunities for strengthened surveillance and improved disease control.

- Ensure vaccination programmes are effectively implemented with detailed reporting of vaccinations against target populations, monitoring of vaccination response and improved cold chain management with routine temperature monitoring.
- Review the current 12-digit identification programme used in some cattle and buffalo and develop a nationally coherent programme to cover all bovines. This will allow disease control activities to be more targeted and effective (e.g. by focusing on identified high risk populations through animal testing and the use and monitoring of vaccination).

➢ ***Food safety***

- Continue to upgrade and build new slaughter facilities.
- Improve slaughter management by preparing guidelines on good slaughter practices and meat hygiene using the HACCP approach.
- Conduct ante- and post mortem inspections using well trained staff and report any findings so that the disease surveillance data may be used and the risks and developing issues identified; veterinary supervision of slaughter is required.
- Address the problem of the widespread use of veterinary medicines by veterinary para-professionals, with minimal veterinary supervision, and the largely uncontrolled dispensing by gopal mitras by tightening dispensing controls and the management and regulation of drug stores. The prudent use of antimicrobials is compromised by the use of 'high end' medicines in routine cases when other drugs would suffice. Veterinary pharmacies and drug stores should be routinely audited by the State Drug Controllers.
- Establish a rigorous national residue testing programme using risk analysis to target priority products. Following detection control measures should be taken to reduce the risk in future. DADF and state AHDs should work closely with FSSAI.

➢ ***Animal welfare***

- Increase input from DADF into animal welfare policy development, legislation and enforcement. Appoint a designated animal welfare officer at DADF to ensure good liaison and coordination.
- Ensure effective reporting systems are in place for all animal welfare issues, use risk analysis and identify key issues to target and address non-compliance.
- Develop detailed rules guiding the sale and humane slaughter of animals.
- Consider options for improving the management of debilitated, moribund or diseased cattle and other animals which may be kept alive resulting in unnecessary suffering – and the risk of further disease spread. Current legislation does permit euthanasia of injured or diseased animals and much more use might be made of these provisions.

I.3.C Interaction with interested parties

➢ ***Communications and consultations***

- Develop a communications strategy with longer timelines and strategic planning; this applies at both national and state levels.
- Increase engagement with the private sector, producer and industry associations, and to develop stronger public-private partnerships for more effective and efficient programme delivery. DADF and state AHDs should encourage the development of

industry and producer groups at national, state and local levels to build ownership and support for programmes.

- India should increase its leadership role in the development of international standards, policies and programmes – particularly given India's technical competence and professional staffing and the importance of the livestock sector in India.

➢ ***Veterinary Statutory Body***

- Review the VCI and ensure it is more representative with increased funding provided directly from the registration of veterinarians and other assessment and licensing activities.
- Review any professional ethics and disciplinary issues more rigorously and hold more frequent disciplinary hearings; reports and annual summaries should be made publicly available.
- Establish the capacity within the VCI or an alternative body for the regulation of veterinary para-professionals.

I.3.D Access to markets

➢ ***Legislation***

- Review and replace outdated legislation.
- Develop technical regulations, currently not available, on issues such as animal feed safety, meat inspection and the stunning of animals.
- Review state legislation to identify gaps and inconsistencies.
- Ensure reports are maintained on compliance activities undertaken and outcomes to allow routine analysis and review of activities; also report on awareness and compliance activities.
- Improve the implementation of the legislation as highlighted in the report and taking into account the results of reviews and analysis as suggested in other recommendations.

➢ ***International relations***

- Take greater international and regional leadership with increased consultation with the private sector in the preparation of submission papers as standards and programmes are developed.
- Make notifications to OIE, WTO-SPS, trading partners and others in real time without undue delays.

➢ ***Zoning and compartmentalisation***

- Support the establishment of the Equine Disease Free Zones (EDFZ) for sport horses.
- Review progress and options for FMD zoning recognising OIE standards for zone freedom - there is a need not only to determine the health status of the proposed zones but also to be able to define and manage sub-populations of all susceptible animals which requires the effective movement control and identification of animals.
- Continue to promote poultry disease free compartments and ensure formal documented recognition of the compartments by trading partners.

PART II: CONDUCT OF THE EVALUATION

At the request of the Government of India, the Director General of the OIE appointed an independent OIE PVS team consisting of Dr John Weaver (Team Leader) and Dr Howard Batho, Dr Susanne Münstermann, Dr John Woodford (Technical Experts) to undertake an evaluation of the VS of India. The team was also accompanied for part of the mission by Dr Caitlin Holley and Dr John Stratton (OIE Observers). The evaluation was carried out in two missions – 19 February to 9 March and 11 April to 2 May 2018.

The evaluation was carried out with reference to the OIE standards contained in Chapters 3.1., 3.2., 3.3. and 3.4. of the OIE *Terrestrial Animal Health Code* (the Terrestrial Code), using the OIE *PVS Tool* (6th edition, 2013) to guide the approach and procedures. Relevant Terrestrial Code references are quoted for each critical competency in Appendix 1.

This report indicates the strengths and weaknesses of the VS of India as compared to the OIE standards and provides a number of recommendations to improve their performance.

II.1 OIE PVS Tool: method, objectives and scope of the evaluation

To assist countries assess the performance of their VS, form a shared vision, establish priorities and carry out strategic initiatives, the OIE has developed the OIE PVS Tool for the Evaluation of Performance of VS. The OIE PVS Tool consists of four fundamental components:

- Human, physical and financial resources
- Technical authority and capability
- Interaction with interested parties
- Access to markets

These four fundamental components cover 47 critical competencies, for each of which five qualitative levels of advancement are described. For each critical competency, a list of indicators was used by the OIE PVS Team to determine the level of advancement. A glossary of terms is provided in Part V, Appendix 2.

The report follows the structure of the OIE PVS Tool and the reader is encouraged to review that document to obtain a good understanding of how the evaluation was conducted.

The objective and scope of the OIE PVS Evaluation includes all aspects relevant to the OIE Terrestrial Animal Health Code and the quality of VS.

II.2 Country information

Geography

India, officially the Republic of India, is the largest country in South Asia and makes up the bulk of the Indian subcontinent. It has a land area of 3,287,263 km^2 –the seventh-largest country in the world. India has a coastline of 7,517 km (5,423 km for peninsular India and the remainder for the Andaman and Nicobar Islands). It is bounded by the Indian Ocean to the south, the Arabian Sea to the southwest, and the Bay of Bengal to the southeast. India has extensive land borders of more than 15,000km with neighbours Pakistan to the west (3,190 km), China (2,659km), Nepal (1,770km) and Bhutan (659km) to the north and Myanmar (1,468km) and Bangladesh (4,142km) to the east. In the Indian Ocean, India is a near neighbour to Sri Lanka and the Maldives; the Andaman and Nicobar Islands share a maritime border with Thailand and Indonesia.

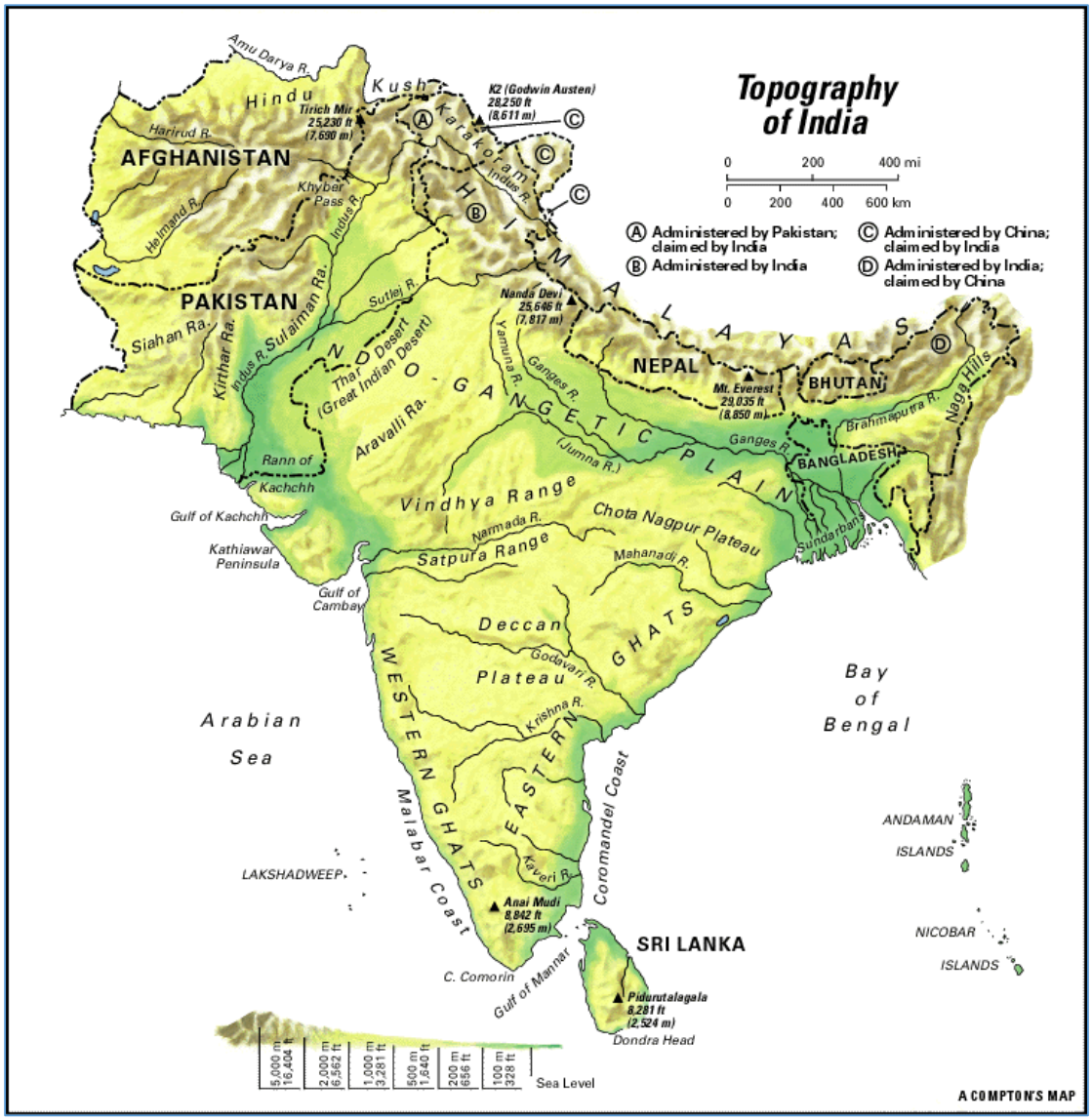
Map 1: India geography showing international boundaries, States and Union Territories and main centres.

Topography

Three major features dominate the Indian landscape: the high, geologically young mountains of the Himalayas, the main body of India, the 'Peninsular', a huge stable massif of ancient crystalline rock, severely weathered and eroded, and the Ganges-Brahmaputra Lowland, a structural trough between the two major rivers, now an alluvial plain. These three major features, plus narrow coastal plains along the Arabian Sea and a wider one along the Bay of Bengal, establish five major physical-economic zones in India. In addition, there are smaller mountain ranges along the southern coasts (the Eastern and Western Ghats) and in central India (the Vindhya and Satpura ranges). The arid Thar Desert lies in the northwest of India.

The Peninsula holds the bulk of India's mineral wealth, and many of its great rivers (the Narbada, Tapti, Mahanadi, Godavari, Krishna, and Kaveri) flowing through it to the sea. The great trench between the Peninsula and the Himalayas is the largest alluvial plain on earth, covering 1,088,000 km^2 and extending without interruption 3,200 km from the Indus Delta (in Pakistan) to the Ganges-Brahmaputra Delta (shared by India and Bangladesh), at an average width of about 320 km. Along this plain flow the Ganges, Brahmaputra, Son, Jumna, Chambal, Gogra, and other major rivers, which provide India with its richest agricultural land.

Map 2: India topography showing mountain ranges, rivers and plains

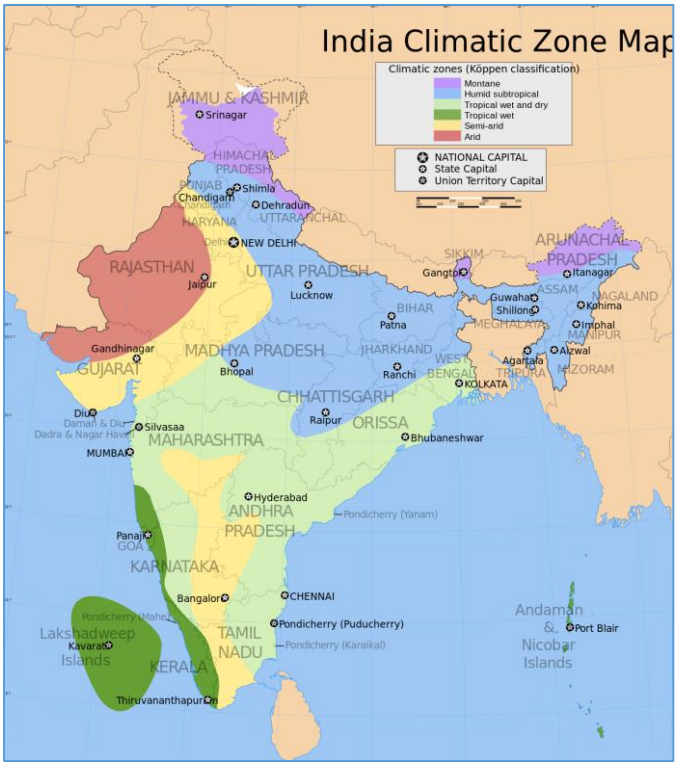


Climate

The climate of India is made up of a wide range of weather conditions across its broad geographic scale and varied topography, making generalisations difficult. It is generally considered that India has six major climatic subtypes, ranging from arid desert in the west, alpine tundra and glaciers in the north, and humid tropical regions supporting rainforests in the southwest and the island territories[1]. Other more complex categorisations of India are also available. Many regions have widely varying microclimates. The country is considered to have four seasons: winter (December, January and February), summer (March, April and May), a monsoon rainy season (June to September), and a post-monsoon period (October to November).

[1] https://en.wikipedia.org/wiki/Climate_of_India

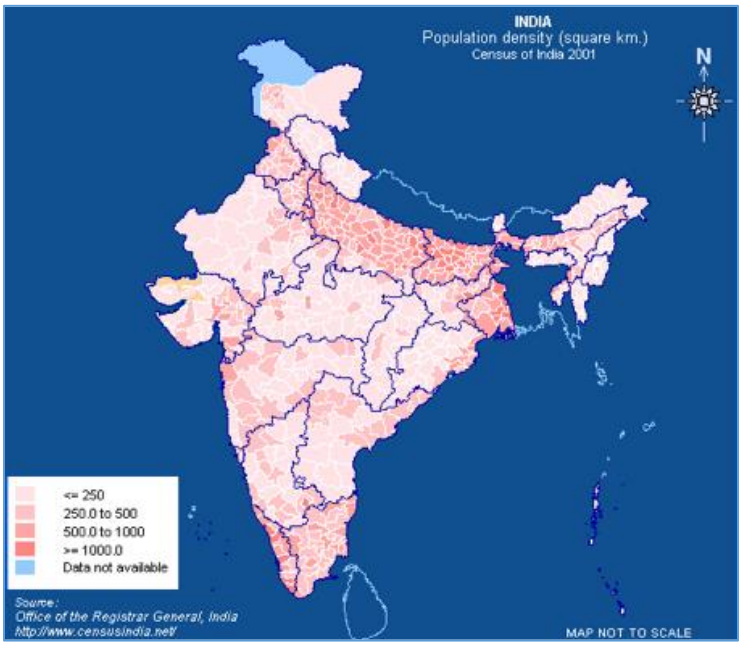
Map 3: India main climate zones



Population

India is the second-most populous country in the world with approximately 1.3 billion people. With the exception of the deserts in the northwest and the mountains in the north, a high population density exists throughout much of the country; the densest populations are in the north along the banks of the Ganges, with other river valleys and the southern coastal areas also having large population concentrations.

Map 4: India population density[2]



[2] http://censusindia.gov.in/Maps/Theme_based_Maps/Map_links/map2.aspx

Government

India is a federal, constitutional republic with representative democracy. The constitution defines the distribution of power in the federation, that is between the Union or Central Government and the states.

India is a federation composed of 29 states and 7 union territories. All states, as well as the union territories of Puducherry and the National Capital Territory of Delhi, have elected legislatures and governments, based on the Westminster model. The remaining five union territories are ruled directly by the Central Government through appointed administrators. In 1956, under the States Reorganisation Act, states were reorganised on a linguistic basis. Since then, their structure has remained largely unchanged though a number of states have been divided increasing their total number; most recently in 2014, Andhra Pradesh was divided into Telangana and a smaller Andhra Pradesh. Each state or union territory is further divided into administrative districts. The districts in turn are further divided into tehsils (sometimes referred to as blocks or mandals) and ultimately into villages.

Central Government

The central government is made up of three branches – executive, legislative and judicial.

Executive

The executive branch of the Indian government consists of the president, the vice-president, and the Council of Ministers, the cabinet being its executive committee, headed by the prime minister. The President of India is the head of state and is elected indirectly by a national electoral college for a five-year term. The Prime Minister of India is the head of government and exercises most executive power; appointed by the president, the prime minister is, by convention, supported by the party or political alliance holding the majority of seats in the lower house of parliament. Any minister holding a portfolio must be a member of one of the houses of parliament. In the Indian parliamentary system, the executive is subordinate to the legislature; the prime minister and his council are directly responsible to the lower house of the parliament. The civil servants are permanent executives and all executive decisions are implemented by them.

Legislation

The legislature of India is the bicameral parliament. It operates under a Westminster-style parliamentary system and comprises the upper house, the Rajya Sabha ('Council of States'), and the lower house, the Lok Sabha (House of the People').

Judiciary

India has a unitary three-tier independent judiciary made up of the Supreme Court, headed by the Chief Justice of India, 24 High Courts, and a large number of trial courts. The Supreme Court has original jurisdiction over cases involving fundamental rights and over disputes between states and the Central Government; it has appellate jurisdiction over the High Courts. It has the power both to declare laws and to strike down Union or state laws which contravene the constitution, as well as to invalidate any government action it deems unconstitutional.

State Government

State governments are similarly made up of three branches of government.

State Executive

State Executive consist of the Governor, a Council of Ministers with a Chief Minister as its head. The executive power of the State is vested in the Governor, who is appointed by the President for a five year term. The Chief Minister is appointed by the Governor who also appoints other ministers on the advice of the Chief Minister. The Council of Ministers is collectively responsible to the legislative assembly of the State. The Council of Ministers, with

the Chief Minister as head, aids and advises the Governor in exercising his/her functions as defined in the Constitution.

State legislature

Each state has a legislature consisting of the Governor and most commonly one 'legislative assembly'; some states have a second chamber, a 'legislative council'. State legislatures have exclusive powers, as per the Constitution, with the financial authority to approve all expenditure, taxation and borrowing by the state government. Bills seeking to impose restrictions on inter-state trade cannot be introduced in a state legislature without previous sanction of the President.

State Judiciary

State High courts have jurisdiction over the whole state, but report to the Supreme Court of India, which may override the State High court's judgements and rulings.

Mandate

Union list

The 'Union List' includes subjects of national importance such as defence of the country, foreign affairs and trade, banking, communications and currency. The Union Government alone can make laws on these subjects. The Union List provides the mandate for Central Government over the participation in international conferences and associations and over trade and commerce with foreign countries including imports and exports.

State list

The 'State List' contains subjects of state and local importance such as police, trade, commerce, agriculture and irrigation. The State Governments alone can make laws relating to these subjects. Agriculture, including agricultural education and research; protection against pests and prevention of plant diseases is under the mandate of the states and includes the preservation, protection and improvement of stock and prevention of animal diseases; veterinary training and practice and the prevention of cattle trespass.

Concurrent list

The 'Concurrent List' includes subjects of common interest to both the Union Government and the State Governments and includes subjects such as education and forestry. Both the Union and the State Governments can make laws on these subjects; if their laws conflict the law made by the Union Government prevails. Criminal laws and procedures are under the Concurrent List and include all matters included in the Code of Criminal Procedure at the commencement of the Constitution; the prevention of cruelty to animals is covered under the Concurrent List.

Livestock

Livestock are an important livelihood activity for most farmers in India with 74% of the population living in rural areas and more than 67% depending on agriculture. Most farmers have small land holdings of less than one hectare – more than 85% of production comes from marginal, small and 'semi-medium' farmers with typically only two or three animals. Livestock usually form part of a mixed farming system with cropping. It is estimated that about 5% of cattle in India are in urban and peri-urban areas and owned by 'landless farmers'.

Animal husbandry makes a significant contribution to the national economy and socio-economic development in the country. In rural India where over 15-20% families are landless and about 80% of the land holders belong to the category of small and marginal farmers, livestock is the main source of livelihood. While the land owners prefer cattle and buffaloes, the landless prefer to own sheep, goats and poultry.

India has one of the largest livestock populations in the world. India is the largest producer of milk in the world and is ranked first in its combined cattle and buffalo population, second in

goats, third in sheep and seventh in poultry. There are about 300 million bovines (mainly cattle and buffaloes also mithuns and yaks), 65 million sheep, 135 million goats and about 10 million pigs (19th Livestock Census, 2012).

Table 2: Total livestock populations by species

#	Species	2007 (millions)	2012 (millions)	Growth Rate (%)
1	Cattle	199.1	190.9	-4.10
2	Buffalo	105.3	108.7	3.19
3	Yaks	0.1	0.1	-7.64
4	Mithuns	0.3	0.3	12.88
Total bovines		304.8	300	-1.57
5	Sheep	71.6	65.1	-9.07
6	Goat	140.5	135.2	-3.82
7	Pigs	11.1	10.3	-7.54
8	Other animals (horses, camels, etc.)	1.7	1.48	-12.94
Total livestock		529.7	512.1	-3.33
9	Chickens	-	692.6	-
10	Ducks	-	23.5	-
11	Others	-	13.0	-
	Total poultry	648.8	729.2	12.39

Milk production in 2016-17 was 165.4 million tonnes with 35.4% from indigenous buffaloes, 25.4% from crossbred cattle, 11.3% from indigenous cattle and with 'non-descript', cross-bred, cattle contributing 9.5% and non-descript buffaloes 13.8% of milk production.

The total poultry population of India is estimated to be 730 million with an egg production of more than 88 billion in 2016-17; poultry meat production is estimated to be 3.46 million tonnes. It is estimated that more than 500 million poultry are on commercial farms and some 217 million in 'backyards'.

Total meat production was 7.4 million tonnes in 2016-17. Wool production was estimated to be 43.5 million kgs in 2016-17.

Figure 1: Meat production by species in 2016/17

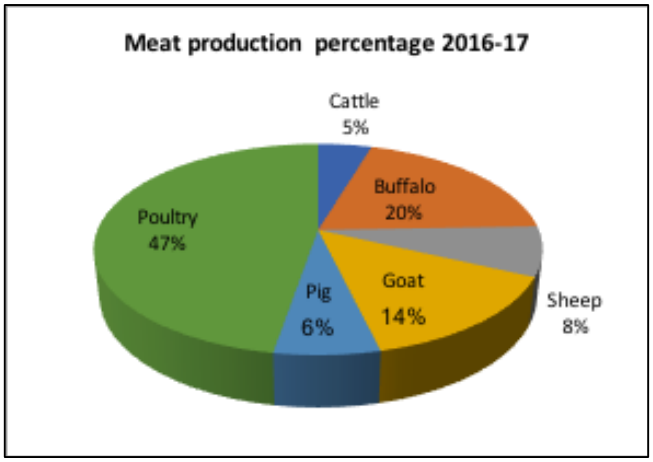


Table 3: Data summary for geography, agriculture and livestock

Geographic features

Agro-ecological zones	Rainfall (mm/year)
Western Himalayan Region	1500
Eastern Himalayan Region	≥2000
Lower Gangetic Plain Region	1000-2000
Middle Gangetic Plain Region	1000-2000
Upper Gangetic Plain Region	750-1500
Trans-Gangetic Plian Region	700-1250
Eastern Plateau & Hill Region	800-1500
Central Plateau & Hill Region	500-1000
Western Plateau & Hill Region	250-750
Southern Plateau & Hill Region	500-1000
East Coast Plain & Hill Region	750-1500
West Coast Plain and Ghat Region	≥2000mm
Gujarat Plain and Hill Region	500-1000
Western Dry Region	≤ 250
Island Region	≤ 3000

Topography	km²	%
Total area	3,287,263	
Pasture lands	102,560	3.1
Agricultural land	1,797,210	54.6
Forest	706,820	21.5
Wetlands/deserts	154,501	4.7
Highlands	NA	17.9

Demographic data

Human population	
Total number	1,352,085,699 (12 May 2018)
Average density / km²	382
% of urban	31.2
% of rural	68.8

Current livestock census data

Animals species	Total Number
Cattle	190,904,000
Buffalo	108,702,000
Sheep	65,069,000
Goat	135,173,000
Pigs	10,293,000
Horses and Ponies	624,000
Poultry	729,209,000

Animal and animal product trade data

Animals and animal products	Average annual import		Average annual export	
	Quantity	Value (INR x 10^5)	Quantity	Value (INR x 10^5)
Livestock	128,510 (head)	6,211	44,500	52,738
Meat & Edible Meat Offal	38,932 tons	1,051	5,591 tons	2,720
Dairy, Poultry Products & Honey	23,682 tons	24,383	25,193 tons	197,523
Animal Fodder & Feed	119,538 tons	331,660	13,141 tons	747,739
Raw hide, skin and leather	82,805 tons	409,008	3,094 tons	596,430
Raw wool and animal hair	101,041 tons	217,310	801 tons	108,367
TOTAL		989,622		44,23,715

Economic data

National GDP	2.848 trillion USD
National budget	336.39 billion USD
Agriculture GDP	4.5% of National GDP
Livestock GDP	17.32% Agriculture GDP
Annual budget of the Veterinary Services	23,710 billion INR (Central component only)

II.3 Context of the evaluation

II.3.A Availability of data relevant to the evaluation

A list of documents received by the OIE PVS Team before and during the PVS Evaluation mission is provided in Appendix 5. All documents and pictures listed in Appendix 5 are referenced to relevant critical competencies to demonstrate the levels of advancement and related findings.

The following table provides an overview of the availability of the main categories of documents or data needed for the evaluation, taking into account the information requirements set out in the OIE Terrestrial Code.

Table 4: Summary of data available for evaluation

Main document categories	Data available in the public domain	Data accessible only on site or on request	Data not available
→ **Animal census:**			
○ at 1st administrative level	x		
○ at 2nd administrative level	x	x	
○ at 3rd administrative level		x	
○ per animal species		x	
○ per production systems			x
→ **Organisations charts**			
○ Central level of the VS	x		
○ 2nd level of the VS		x	
○ 3rd level of the VS		x	
→ **Job descriptions in the VS**			
○ Central levels of the VS		x	
○ 2nd level of the VS		x	
○ 3rd level of the VS		x	
→ **Legislations, regulations, decrees …**			
○ Animal health and public health	x		
○ Veterinary practice	x		
○ Veterinary statutory body	x		
○ Veterinary medicines and biologicals	x		
○ Official delegation	x		
→ **Veterinary census**			
○ Global (public, private, veterinary, para-professional)	x		
○ Per level		x	
○ Per function		x	
→ **Census of logistics and infrastructures**		x	
→ **Activity reports**		x	
→ **Financial reports**		x	
→ **Animal health status reports**		x	
→ **Evaluation reports**		x	
→ **Procedures, registers, records, letters …**		x	

II.3.B General organisation of the Veterinary Services

Central Government

Organisation

Under the Constitution (List II of the Seventh Schedule) animal health and production and the delivery of veterinary services is a state function; the national government is required to protect and promote livestock farming and production, including maintaining national biosecurity and border control and to cooperate with international organisations. DADF 'advises' State Governments/Union Territories on the formulation of policies and programmes in the field of animal husbandry, dairy development and fisheries.

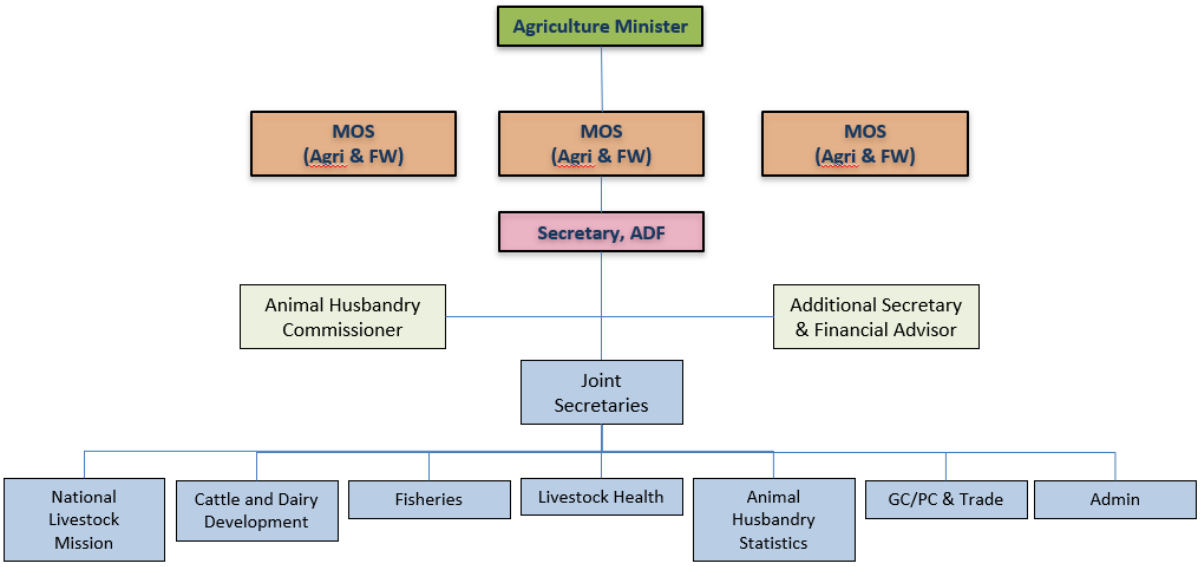
The Department of Animal Husbandry, Dairying & Fisheries (DAHDF or more commonly DADF) is one of the Departments under the Ministry of Agriculture and Farmers Welfare. It came into existence on 1st February, 1991 following the merger of two Divisions of the Department of Agriculture and Cooperation (Animal Husbandry and Dairy Development Departments). The Fisheries Division of the Department of Agriculture & Cooperation and a part of the Ministry of Food Processing Industries was transferred to this Department in 1997.

The Department is under the overall charge of Union Minister of Agriculture and Farmers Welfare. He is assisted by Ministers of State for Agriculture and Farmers Welfare. The administrative head of the Department is the Secretary (Animal Husbandry, Dairying & Fisheries). The Secretary of the Department is assisted by Animal Husbandry Commissioner, five Joint Secretaries and one Adviser (Statistics) in discharging the responsibilities assigned to this Department.

Technical leadership is provided nationally by the Animal Husbandry Commissioner (AHC), equivalent to the CVO, of DADF and he/she has the authority to establish animal health policies and programmes in collaboration with the senior staff, the Secretary and Joint Secretaries, who are Indian Administrative Staff (IAS), career civil servants, that is they are not veterinarians.

The AHC has a team of technical support staff working with him (Joint Commissioners, Deputy Commissioners, Assistant Commissioners and Livestock Officers) at central level to carry out national programmes and schemes; these technical staff do not report directly to the AHC but to a Joint Secretary. The chain of command works in DADF, though owing to the matrix management approach and absence of direct line management there is a risk of compromises being made.

Figure 2: Organisational chart of senior staff at DADF

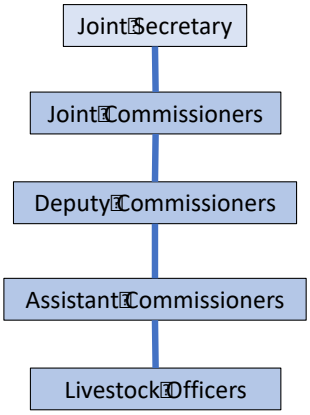


The Joint Secretary of Livestock Health manages six divisions/sections and a team of technical officers, with technical leadership being provided by the AHC. The divisions/sections are:

1. **Livestock Health** – this Division deals with schemes related to livestock health, including the National Institute of Animal Health, the National Project on Rinderpest Surveillance & Monitoring, the animal quarantine & certification services, matters relating to UTs which do not have legislatures and with work relating to Veterinary Council of India.
2. **Cattle & Dairy Development** – this division manages the schemes under National Dairy Plan including the dairy development schemes, National Programme for Bovine Breeding and Dairy Development (NPBB, the Central Cattle Development Organization (CCDO), administration for the Delhi Milk Scheme (DMS) and National dairy Development Board (NDDB), and all matters related to the Dairy Division.
3. **National Livestock Mission** – responsible for poultry development, the Central Poultry Development Organizations, for pigs, equine & pack animals, feed & fodder, slaughterhouses, meat and meat products, the Central Fodder Development Organizations, goat and sheep development and also for work relating to the central sheep breeding farms, animal husbandry extension activities and the Livestock Insurance Scheme.
4. **Fisheries** – this division deals with the policy, regulation and development of fisheries
5. **Animal Husbandry Statistics** – this division undertakes the livestock census, conducts integrated sample surveys and updates and manages all matters related to animal husbandry statistics and provides the data to develop planning related projects for the livestock sector.
6. **Trade** – this division deals with matters related to trade and Codex Alimentarius, planning and generally provides coordination and international cooperation.

The organisational structure for the technical staff is shown in Figure 3.

Figure 3: Organisational chart of technical staff of DADF



The commissioners and livestock officers have designated technical and programme roles covering coordination of DADF with the states, the delivery of schemes (variously disease surveillance and control and development of the veterinary services), emergency preparedness and response, coordination of veterinary laboratories, communication with international bodies and trading partners and support of the Veterinary Council of India

DADF subordinate offices

In addition, DADF has 34 subordinate offices located across the country for breed improvement, poultry development, sheep development, fodder development, quality control of veterinary biologicals, trade and the Delhi Milk scheme.

Legislation

A number of acts and subordinate rules provide the legal mandate for DADF and the VS in India. Veterinary legislation is covered in more detail in CCIV-1. In summary, the main acts applying to the veterinary domain include:

- The Prevention & Control of Infectious and Contagious Diseases in Animals Act (2009) which seeks to prevent and/or control the spread of economically important infectious and contagious animal diseases from one part of the country to another and so to reduce their economic impact, and also to promote the import and export of animals and animal products by meeting India's international obligations;
- The National Disaster Management Act (2005) provides guidelines for management of livestock disasters;
- The Livestock importation (Amendment) Act (2001) provides the mandate and method of International Animal Health Certification;
- Foreign Trade Regulation Act (1992);
- Indian Veterinary Council Act (1984) regulates veterinary practice and veterinary education in the country;
- Prevention of Cruelty in Animals Act (1960) regulates animal welfare;
- Drug and Cosmetics Act (1940) regulates the import, manufacture, distribution and sale of drugs.

Statutory bodies

Three statutory bodies are work cooperatively with the Livestock sector of DADF:

1. **National Dairy Development Board** (NDDB) – became a statutory body in 1987; the NDDB is the premier institution tasked with accelerating the pace of cooperative dairy development in the country.
2. **Veterinary Council of India** (VCI) – is the statutory body constituted under the Veterinary Council Act (1984). The Veterinary Council of India is responsible for regulating veterinary practice as well as for maintaining standards of veterinary education through minimum standards for veterinary education in all veterinary institutes across the country.
3. **Animal Welfare Board of India** (AWBI) (organisationally within MoEFCC) – is the statutory body responsible for promoting animal welfare in India; it was established under the Prevention to Cruelty to Animals Act (1960).

Department of Agriculture Research and Education

Department of Agriculture Research and Education (DARE), under the Ministry of Agriculture and Farmers Welfare, coordinates and promotes agricultural research & education in the country. DARE provides the government linkages for the Indian Council of Agricultural Research (ICAR), the premier research organisation for co-ordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences for the entire country. There are 101 ICAR institutes and 71 agricultural universities spread across the country making it one of the largest national agricultural research systems in the world.

ICAR is an autonomous organisation under DARE that was formally established in 1929. The ICAR Council is the apex body for co-ordinating, guiding and managing research and education in agriculture including animal sciences in the country. The Animal Science Division of ICAR coordinates and monitors research activities in its 19 research institutes and their regional centres/stations:

- Deemed universities (2)[3]
  - ICAR-Indian Veterinary Research Institute, Izatnagar
  - ICAR-National Dairy Research Institute, Karnal
- National Institutes (8)
  - ICAR-Central Institute for Research on Buffalos, Hisar
  - ICAR-Central Institute for Research on Goats, Makhdoom
  - ICAR-Central Sheep Wool Research Institute, Avikanagar
  - ICAR-Central Avian Research Institute, Izatnagar
  - ICAR-Central Institute for Research on Cattle, Meerut
  - ICAR-National Institute on Animal Nutrition and Physiology, Bengaluru
  - ICAR-National Institute on High Security Animal Disease, Bhopal
  - ICAR-National Institute on Veterinary Epidemiology and Disease Informatics, Bengaluru
- Bureau (1)
  - ICAR-National Bureau of Animal Genetic Resource, Karnal
- National Research Centres (6)
  - ICAR-National Research Centre Equine, Hisar
  - ICAR-National Research Centre Camel, Bikaner
  - ICAR-National Research Centre Yak, Dirang
  - ICAR National Research Centre Mithun, Medziphema
  - ICAR-National Research Centre Pig, Guwahati
  - ICAR-National Research Centre Meat, Hyderabad

[3] A term used by ICAR – primarily research institutes but now “deemed” to be university faculties.

- Directorates (2)
    - ICAR-Directorate on Foot and Mouth Disease, Mukteswar
    - ICAR-Directorate on Poultry Research, Hyderabad

Vaccine production and import

The import, manufacturing and marketing of animal vaccines is regulated in accordance with the Drugs & Cosmetics Act (1940).

There are 20 state veterinary biological production centres in India which are under the control of State Animal Husbandry Departments. These production units produce various vaccines such as HS, bluetongue, CSF, anthrax, BQ, ND, IBD, rabies, sheep and goat pox, fowl cholera, FMD, PPR, fowl and pigeon pox, enterotoxaemia, duck cholera, duck virus hepatitis. Diagnostic test reagents are also produced – such as *Brucella* and *Salmonella* antigens.

The vaccines used in the national disease control programme are manufactured by M/s Indian Immunologicals (Hyderabad), M/s Brilliant Bio Pharma (Hyderabad), M/s Biovet (Bangalore) and M/s Intervet (Pune).

There are also vaccine manufacturers who produce and export a wide range of vaccines against FMD, HS, BQ, Theileriosis, Brucellosis, Sheep Pox, blue tongue, PPR, Rabies, ND, Marek's disease and other poultry vaccines. In addition, the government operates two vaccine quality control testing laboratories:

- ICAR-IVRI, Izatnagar/Bengaluru
- CCS National Institute of Animal Health, Baghpat

Pharmaceutical production

The Indian animal healthcare market is estimated to be worth around 60,000 million INR in 2018[4] made up of 50% for livestock, 40% for poultry, 5% for companion animals and 5% others. There is no formal data but it is estimated that this market is made up of 40% for feed supplements, 17% for antibacterials, 15% for biosecurity, 13% for parasiticides, 5% for hormones and biologicals and 10% for others. There are some 50 major production companies though the market is dominated by the top ten players.

No further information was available to the mission.

Operations

DADF implements the 'Livestock Health & Disease Control' scheme to maintain livestock health and disease control. The major sub-schemes in the current period are:

- Assistance to States for Control of Animal Diseases (ASCAD) – including the control of glanders, HPAI and rabies
- Professional Efficiency Development (PED)
- National Project on Rinderpest Surveillance & Monitoring (NPRSM)
- Foot and Mouth Disease Control Programme (FMD-CP)
- National Animal Disease Reporting System (NADRS)
- Peste des Petits Ruminants Control Programme (PPR-CP)
- Brucellosis Control Programme (Brucellosis - CP)
- Establishment and Strengthening of Veterinary Hospitals and Dispensaries (ESVHD)
- Classical Swine Fever Control Programme (CSF-CP)

[4] www.infah.org

Funding

DADF is funded through a formal budget process of programme development and cost estimation, initially developed by DADF staff before approval by senior MoA&FW managers and the Minister. The budget is then reviewed by the Ministry of Finance before debate and approval in parliament.

For the 12th Five Year Plan (2012-2017), DADF had an approved budget of 141.79 billion INR (approximately 2.63 billion USD) divided into annual increments. The table below shows the annual increments and the percentage utilised per year.

Table 5: Five year DADF budget and its utilisation

Year	Approved budget (million INR)	Actual (million INR)	% utilisation
2012-13	19,100	17,364	90.9
2013-14	20,250	17,488	86.4
2014-15	21,740	17,381	79.9
2015-16	14,911	14,182	95.1
2016-17	16,000	17,431	84.3

It was explained that the year on year availability and the percentage utilised varied considerably owing to national and state elections when fund utilization is limited; in addition there is often a delay in the release of budget to the states as the state do not always submit proposals on time.

For the year 2017-18, the Department was allocated 23.71 billion INR (including Plan & Non-Plan) which was later decreased at the budget estimation review stage to 21.67 billion INR. By the end of 2017, it was estimated that the Department had incurred an expenditure of 15.11 billion INR of its allocated fund for the financial year 2017-18. (Note in India the financial year is April-March)

DADF distributes funding to the states for key approved 'schemes' (as above) according to a predetermined formula. In most of India DADF contributes 60% of the funding with the states providing 40%. In the 'Himalayan' and 'North-East' states the ratio is 90:10 national to state. The national government provides all the funding for schemes in the UTs.

The Rashtriya Krishi Vikas Yojana (RKVY) scheme was initiated in 2007 to ensure that states supported the 'holistic development of agriculture and allied sectors'. The scheme provides additional funding for the livestock sector including supporting the veterinary infrastructure and equipment (laboratories, veterinary clinics) and operational activities such as the provision of vaccine. The budget available is approximately 40 billion INR annually.

Competent authorities

The Central government has a broad network and programmes working with competent authorities including:

1. **Ministry of Health and Family Welfare** (MoH&FW) – multi-sectorial coordination on prevention, control and containment of zoonoses. A 'Joint Monitoring Group on Avian Influenza' works with MoH&FW with representatives from DADF, WHO, NCDC, Ministry of Environment and Climate Change (MoEFFCC) and ICMR. There is also a 'Task Force on Swine Influenza', 'Joint Action Committee on Rabies' and a 'Joint working group on AMR'. In addition there are regular meetings held with MoH&FW and other stakeholders to discuss arising issues. The Integrated Disease

Surveillance Programme (IDSP) is a network of the National Centre for Disease Control operating in 22 States and 374 Districts; veterinary staff are included in the 'Rapid Response Teams' for surveillance and monitoring of various zoonotic diseases.

2. **Central Drugs Standard Control Organization** (CDSCO) of the MoH&FW – is the 'Central Drug Authority', that is the national authority established to manage the regulatory control over the import of drugs, and the approval of new drugs and clinical trials. Under the Drug and Cosmetics Act, the regulation of manufacture, sale and distribution of drugs is primarily the concern of the State authorities; the Central Authorities are responsible for the approval of new drugs, clinical trials in the country, setting standards for drugs, control over the quality of imported drugs, and coordinates the activities of the state drug control organisations and provides expert advice to bring uniformity in the enforcement of the act. The 'Drug Controller General of India' is responsible for approval of licenses for specified categories of drugs.
3. **Directorate General of Foreign Trade –** DADF manages proposals for the import/export/manufacturing/marketing of livestock and livestock related commodities including vaccines, drugs & biologicals received from various state governments, companies and organisations. DADF's recommendations are communicated to the Directorate General of Foreign Trade, the CDSCO 'Drugs Controller of India' for approval of the necessary import license after consideration by a 'Committee on Trade & Investment Matters'.
4. **Export Inspection Council** (EIC) – Is tasked with ensuring the sound development of export trade through quality control and inspection. It is an advisory body to the Central Government empowered to establish standards of quality, specify the type of quality control required using formal in-process quality control and self-certification.
5. **Food Safety and Standards Authority of India** (FSSAI) – was established under Food Safety and Standards Act (2006) to set standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption.
6. **Agricultural and Processed Food Products Export Development Authority** (APEDA) – established under the Agricultural and Processed Food Products Export Development Authority Act (1985) with the responsibility of export promotion and development of the scheduled products of animal origin including meat and meat products, poultry and poultry products and for dairy products.
7. **Ministry of Environment, Forest and Climate Change** (MoEFCC) – the agency of Central Government for the planning, promotion, co-ordination and oversight of India's environmental and forestry policies and programmes. The primary concerns of this Ministry are the implementation of policies and programmes relating to conservation of the country's natural resources including its lakes and rivers, its biodiversity, forests and wildlife, ensuring the welfare of animals, and the prevention and abatement of pollution.

States and Union Territories

Organisation

Each state has the autonomy to implement its own state priorities, including providing clinical veterinary services as well as supporting nationally endorsed programmes. At state level a cabinet ranked minister is head of the animal husbandry department and is responsible for the decisions and policies of both the state and central government.

State departments have a broad mandate including: preventative and curative health care, promoting animal production (breeding, semen production, fodder improvement, conservation of biodiversity/wildlife with the forestry departments), meeting food safety standards, providing economic support and well-being to farmers.

The states vary in their exact structures and the names and position titles used. The general organisational chart for states is shown in the Figure below.

Figure 4: Typical state management organisational chart

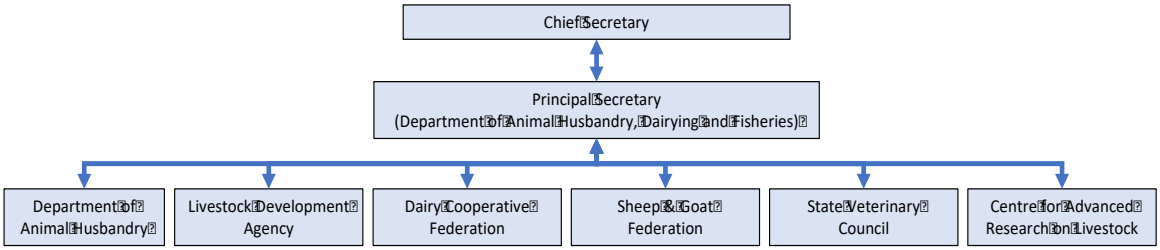
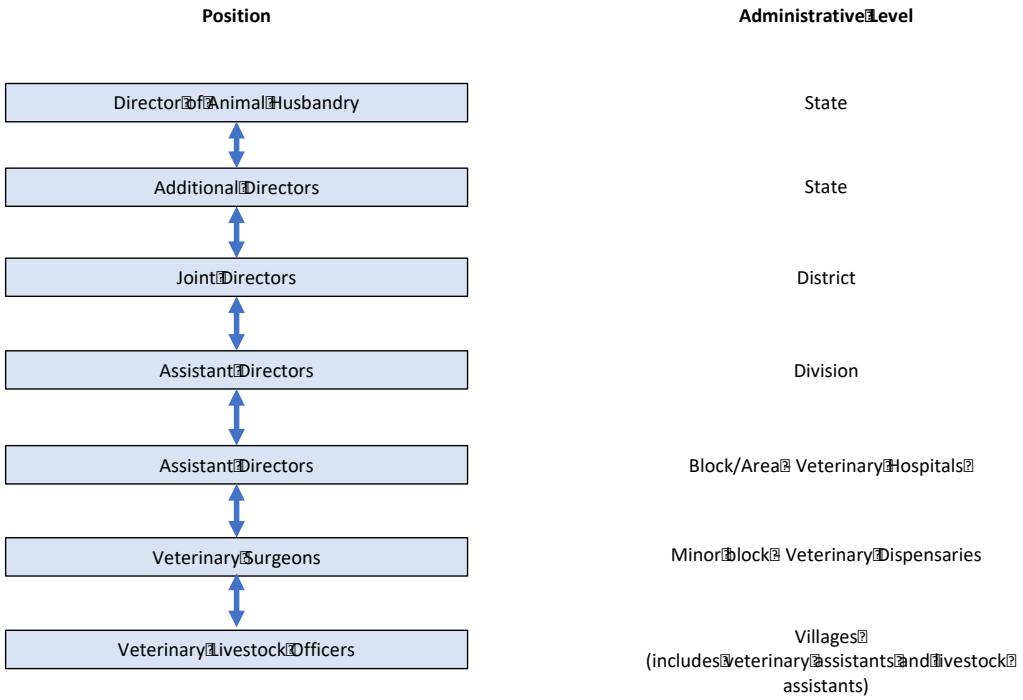


Figure 5: Typical state organisational chart for technical officers



Infrastructure

The states and UTs have considerable infrastructure to deliver clinical animal health services including the well equipped veterinary hospitals or polyclinics with generally good facilities for animal care (both small and large animals), veterinary dispensaries which would more commonly be referred to as veterinary clinics with basic clinical services also for large and small animals and veterinary aid centres which are local/village centres providing first level care by veterinary para-professionals. The numbers per state and UT are shown in the table below.

Table 6: Numbers of veterinary institutions by state/UT

#	State/UT	Veterinary Hospitals/ Polyclinics	Veterinary Dispensaries	Veterinary Centres/ Mobile units	Total
1	Andhra Pradesh	335	1576	1262	3173
2	Arunachal Pradesh	1	109	289	399
3	Assam*	29	541	767	1337
4	Bihar	39	1083	1595	2717
5	Chhattisgarh	301	798	435	1534
6	Goa	5	23	52	80
7	Gujarat	33	702	827	1562
8	Haryana	964	1812	21	2797
9	Himachal Pradesh	410	1772	1251	3433
10	Jammu & Kashmir	293	1900	669	2862
11	Jharkhand	27	424	433	884
12	Karnataka	694	1833	1688	4215
13	Kerala	279	867	20	1166
14	Madhya Pradesh	1063	1585	65	2713
15	Maharashtra	200	1741	2906	4847
16	Manipur	56	109	34	199
17	Meghalaya	4	114	122	240
18	Mizoram#	5	35	103	?143
19	Nagaland	11	30	130	171
20	Odisha	541	3839	314	4694
21	Punjab	1389	1489	20	2898
22	Rajasthan	2527	198	3672	6397
23	Sikkim	18	60	54	132
24	Tamil Nadu	171	2581	831	3583
25	Telangana	108	908	1101	2117
26	Tripura	16	60	433	509
27	Uttarakhand	328	10	778	1116
28	Uttar Pradesh	2208	267	3238	5713
29	West Bengal	112	610	2659	3381
30	A & N Islands	10	12	11	?32
31	Chandigarh	5	9	-	14
32	Dadra & Nagar Haveli*	-	1	-	1
33	Daman & Diu	-	2	3	5
34	Delhi*	50	26	-	76
35	Lakshadweep	3	6	1	10
36	Puducherry	-	17	74	91
	TOTAL	**12,235**	**27,149**	**25,858**	**65, 242**

Manpower

Nationally, the total number of registered veterinarians is 72,216 as per the Veterinary Council of India (12/04/2018); there is no breakdown available by type of veterinarian – that is private sector, industry, academic etc. There are 102,000 artificial insemination technicians.

Funding

Each state AHD has its own budget funded through the state from local revenues and with support from the national government for the ASCAD 'schemes' (as above) and also via the RKVY programme. States vary in their economies and stages of development and this is reflected in their resources.

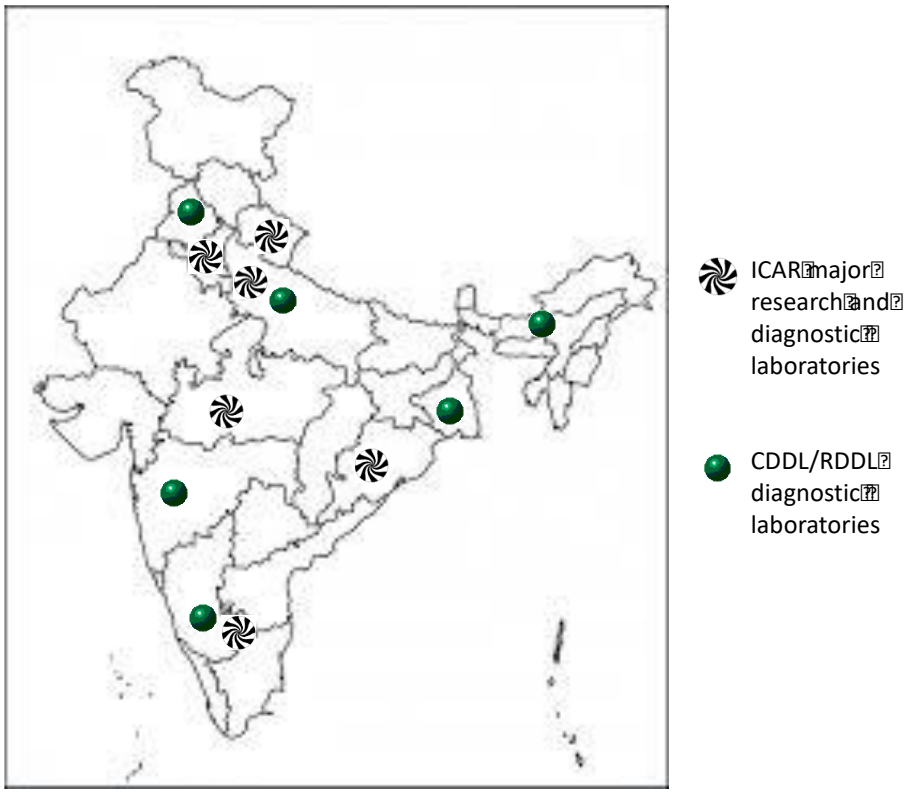
There is strong philanthropic support for the VS from corporate social responsibility programmes and directly from private donors.

States do not operate a user-pays approach and most programmes are delivered at no or minimal cost with substantial subsidies.

Laboratories

India has an extensive diagnostic laboratory network with laboratories operating at local level providing basic services in parasitology and haematology and less frequently bacteriology, intermediate laboratories providing a broader range of testing with virology (most commonly ELISA tests) and bacteriology and increasingly the use of molecular testing. The main regional and 'central' laboratories provide a comprehensive range of tests and are supporting by specialist and national reference laboratories.

Map 5 : Main national diagnostic laboratories



The RDDLs/CDDL laboratories are the Centre for Animal Disease Research and Diagnosis (CADRAD) of Indian Veterinary Research Institute (Izatnagar), the Disease Investigation Laboratory (Pune), Institute of Animal Health and Veterinary Biologicals (Kolkata), Institute of Animal Health & Biologicals (Bangalore), Animal Health Institute

(Jallandhar) and Institute of Veterinary Biologicals (Guwahati); these laboratories operate as regional referral laboratories and each have BSL-3 facilities available.

The recognised specialist research and diagnostic laboratories are:

- ICAR - National Institute of High Security Animal Disease, Bhopal: avian Influenza and other exotic diseases (OIE Reference Laboratory for avian influenza)
- National Research Centre on Equines, Hisar: equine diseases (OIE Twinning Laboratory for equine influenza, piroplasmosis, glanders)
- Veterinary College, Bengaluru: rabies (OIE Twinning Laboratory for rabies)
- ICAR - Directorate on Foot and Mouth Disease, Mukteswar: FMD
- ICAR-ICFMD, Bhubaneswar: FMD (Not yet commissioned)

In addition, there are 31 FMD Regional Research Centres for FMD surveillance, diagnosis and monitoring and the ICAR-National Institute of Veterinary Epidemiology and Disease Informatics which has 32 collaborating units for Regional Animal Disease Monitoring and Surveillance (ADMAS).

There are 256 state laboratories recognised under the avian influenza preparedness and response programme with 23 having BSL-2 facilities.

Table 7: Number of diagnostic laboratories by type

National	
RDDLs	5
CDDL	1
Specialist	5
State	
Local and state	256
Veterinary colleges	43
'ELISA' laboratories	33

Veterinary schools

The country has a large network of agricultural training system with 46 veterinary colleges – 43 government and three private colleges. The competencies of education at veterinary schools is managed by the Veterinary Council of India; proposals are well advanced to define training for veterinary para-professionals. Currently there are:

- 31 Colleges under 15 State Veterinary & Animal Science universities
- 12 Colleges under 11 State Agricultural universities
- 3 Colleges under 3 Central universities.

The degree qualifications of 13 foreign universities are also recognized.

There are also 18 institutions offering diploma/certificate courses in 'minor' veterinary services, that is veterinary para-professional training.

Table 8: Veterinary schools in India by state

#	State	College
1.	Andhra Pradesh	College of Veterinary Science, Tirupati
		NTR College of Veterinary Science, Gannavaram
		College of Veterinary Science, Proddatur
2.	Assam	College of Veterinary Science, Guwahati
3.	Chhattisgarh	College of Veterinary Science & Animal Husbandry, Durg
4.	Gujarat	College of Veterinary Science and Animal Husbandry, Anand
		College of Veterinary Science and Animal Husbandry, Sardarkrushinagar
		College of Veterinary Science and Animal Husbandry, Navsari
		College of Veterinary Science and Animal Husbandry, Junagadh
5.	Haryana	College of Veterinary Science, Hisar
6.	Himachal Pradesh	Dr. G.C. Negi College of Veterinary and Animal Sciences, Palampur
7.	Jammu & Kashmir	Faculty of Veterinary Sciences & Animal Husbandry, Jammu
		Faculty of Veterinary Sciences & Animal Husbandry, Srinagar, Kashmir
8.	Jharkhand	Ranchi College of Veterinary Science and Animal Husbandry, Ranchi
9.	Karnataka	Veterinary College Hebbal, Bangalore
		Veterinary College Nandinagar, Bidar
		Veterinary College, Hassan
		Veterinary College, Shimoga
10.	Kerala	College of Veterinary & Animal Sciences, Thrissur
		College of Veterinary and Animal Sciences, Pookote
11.	Madhya Pradesh	College of Veterinary Science & Animal Husbandry, Jabalpur
		College of Veterinary Science & Animal Husbandry, Mhow
		College of Veterinary Science & Animal Husbandry, Rewa
12.	Maharashtra	College of Veterinary & Animal Sciences, Parbhani
		Nagpur Veterinary College, Nagpur
		Bombay Veterinary College, Mumbai
		College of Veterinary & Animal Sciences, Udgir
		K.N.P. College of Veterinary Sciences, Satara
13.	Mizoram	College of Veterinary Science & Animal Husbandry, Aizawl, Mizoram
14.	Odisha	College of Veterinary Science and Animal Husbandry, Bhubaneswar
15.	Bihar	Bihar Veterinary College, Patna
16.	Puducherry	Rajiv Gandhi College of Veterinary & Animal Sciences, Puducherry
17.	Punjab	College of Veterinary Science, Ludhiana
18.	Rajasthan	College of Veterinary and Animal Science, Bikaner
19.	Tamil nadu	Madras Veterinary College, Chennai
		Veterinary College and Research Institute, Namakkal
20.	Telangana	College of Veterinary Science, Hyderabad
		College of Veterinary Science, Korutla
21	Tripura	College of Veterinary Science & Animal Husbandry at R.K. Nagar, Agartala
22.	Uttar Pradesh	College of Veterinary Science and Animal Husbandry, Faizabad
		College of Veterinary Science and Animal Husbandry, Mathura
23.	Uttarakhand	College of Veterinary & Animal Sciences, Pantnagar
24.	West Bengal	Faculty of Veterinary &Animal Sciences, Kolkata
Private Colleges		
1.	Punjab	Khalsa College of Veterinary and Animal Sciences, Amritsar
2.	Rajasthan	Arawali Veterinary College, Sikar
		Mahatma Jyotiba Fule College of Veterinary and Animal Science, Chomu, Jaipur

II.3.C Animal disease occurrence

OIE has recognised India as free from rinderpest (2006), contagious bovine pleuro-pneumonia (2007), mad cow disease (2010) and African horse sickness (2014); India has an official 'negligible BSE risk status' (OIE, 2017).

Information on animal disease occurrence from the OIE website is shown below in Tables 9 and 10.

Table 9: Disease status of India in 2016 (2017 figures not available as disease report not submitted as at May 2018).

	Domestic		Wild	
Disease	**Notifiable**	**Status**	**Notifiable**	**Status**
Anthrax	✓	Disease limited to one or more zones	✗	Disease limited to one or more zones
Bluetongue	✓	Disease limited to one or more zones	✗	No information
Bovine anaplasmosis	✓	Disease limited to one or more zones	✗	No information
Bovine babesiosis	✓	Disease limited to one or more zones	✗	No information
Bovine tuberculosis	✓	Disease suspected but not confirmed and limited to one or more zones	✗	No information
Brucellosis (Brucella abortus)	✓	Disease limited to one or more zones	✗	No information
Classical swine fever	✓	Disease limited to one or more zones	✗	No information
Contagious cap. pleuropneumonia	✓	Disease limited to one or more zones	✗	No information
Crimean Congo haemorrhagic fever	✓	Infection/infestation	✗	No information
Echinococcus granulosus (Infection with)	✗	Infection/infestation	✗	No information
Epizootic ulcerative syndrome	✗	Disease limited to one or more zones	✗	Disease limited to one or more zones
Equid herpesvirus-1 (EHV-1) (Infection with)	✗	Disease present	✗	No information
Foot and mouth disease	✓	Disease limited to one or more zones	✗	Suspected (not confirmed)
Fowl typhoid	✓	Disease limited to one or more zones	✗	No information
Glanders	✓	Disease limited to one or more zones	✗	No information
Haemorrhagic septicaemia	✓	Disease limited to one or more zones	✗	No information
Highly path. avian influenza	✓	Disease limited to one or more zones	✗	Disease limited to one or more zones
Infec bursal disease (Gumboro)	✓	Disease limited to one or more zones	✗	No information
Infection with Perkinsus olseni	✗	Disease present	✗	Disease present
Infectious hypodermal and haematopoietic necrosis	✗	Disease limited to one or more zones	✗	Disease limited to one or more zones
Infectious myonecrosis	✗	Disease limited to one or more zones	✗	Never reported
Japanese encephalitis	✗	Infection/infestation limited to one or more zones	✗	No information
Newcastle disease	✓	Disease limited to one or more zones	✗	
Peste des petits ruminants	✓	Disease limited to one or more zones	✗	No information
Porcine reproductive/respiratory syndr.	✓	Disease limited to one or more zones	✓	Absent (since Unknown)
Rabies	✓	Disease limited to one or more zones	✗	No information
Sheep pox and goat pox	✓	Disease limited to one or more zones	✗	Disease limited to one or more zones
Trypanosomosis	✓	Disease limited to one or more zones	✗	No information
White spot disease	✗	Disease limited to one or more zones	✗	Disease limited to one or more zones

Table 10: Exceptional epidemiological event notifications by India in 2017 and 2016

Country	Date of Notification	Disease	Reason for notification	Disease manifestation	Outbreaks	Date resolved
India	19/01/2017	Highly path. avian influenza	Recurrence	Clinical disease	3	06/06/2017
India	17/01/2017	Highly pathogenic influenza A viruses (infection with) (non-poultry including wild birds)	Recurrence	Clinical disease	4	06/06/2017

Country	Date of Notification	Disease	Reason for notification	Disease manifestation	Outbreaks	Date resolved
India	20/01/2016	Highly path. avian influenza	Recurrence	Clinical disease	1	27/04/2016
India	12/05/2016	Highly path. avian influenza	Recurrence	Clinical disease	1	05/09/2016
India	04/11/2016	Highly path. avian influenza	Recurrence	Clinical disease	25	06/06/2017
India	09/11/2016	Highly path. avian influenza	Recurrence	Clinical disease	1	06/06/2017
India	10/11/2016	Highly path. avian influenza	Recurrence	Clinical disease	1	06/06/2017
India	25/11/2016	Highly path. avian influenza	Recurrence	Clinical disease	1	06/06/2017
India	28/12/2016	Highly path. avian influenza	Recurrence	Clinical disease	4	16/06/2017

II.4 Organisation of the evaluation

II.4.A Timetable of the mission

Appendix 3 provides the timetable of the mission, the facilities and locations visited by the OIE PVS Team and lists the more senior people met. Appendix 4 provides the international air travel itinerary of team members.

II.4.B Categories of sites and sampling for the evaluation

Table 5 lists the numbers of site, relevant to the evaluation, by category in the country. It indicates the number of the sites visited, in comparison with the suggested sampling framework ("ideal" sampling) recommended in OIE PVS Manual.

Appendix 3 provides a detailed list of sites visited and meetings conducted.

Table 10: site sampling

	Terminology or names used in the country	Number of sites	"Ideal" sampling	Actual sampling
GEOGRAPHICAL ZONES OF THE COUNTRY				
Climatic zone	*Extreme North, North East, North, North West, South, West Coast*	6	6	6
Topographical zone	*Northern Mountain, Peninsular plateau, Indo Gangetic Plain, Thar desert, Coastal plain, Islands.*	6	6	5
Agro-ecological zone	Western Himalayan Region, Eastern Himalayan Region, Lower Gangetic Plain Region, Middle Gangetic Plain Region, Upper Gangetic Plain Region, Trans-Gangetic Plain Region, Eastern Plateau & Hill Region, Central Plateau & Hill Region, Western Plateau & Hill Region, Southern Plateau & Hill Region, East Coast Plain & Hill Region, West Coast Plain and Ghat Region, Gujarat Plain and Hill Region, Western Dry Region, Island Region	15	10	13
ADMINISTRATIVE ORGANISATION OF THE COUNTRY				
1st administrative level	*Central Govt./State/Union Territory*	1/29/7	10	21+2
2nd administrative level	*District*	712	26	51
3rd administrative level	*Block, villages*	5,410+ 597,464	-	180
Urban entities	Urban local bodies – Municipal bodies	4,041	-	51
VETERINARY SERVICES ORGANISATION AND STRUCTURE				
Central (Federal/National) VS	DADF (Department of AHDF)	1	1	1
Internal division of the central VS	Divisions-Livestock Health, Cattle & Dairy development, National Livestock Mission, Trade, Animal Husbandry Statistics	5	5	5
1st level of the VS	State/UT Animal Husbandry Department	36	10	23
2nd level of the VS	Regional/District	712	26	51
3rd level of the VS	Block level	5,410	-	180
Veterinary organisations (VSB, unions…)	Veterinary Council of India, State Veterinary Councils	35	10	7
FIELD ANIMAL HEALTH NETWORK				

Field level of the VS (animal health)	Polyclinic/Veterinary Hospital	12,234	110	Each of 23 states
	Veterinary Dispensary	27,140	165	
	Veterinary Aid Centre/ Mobile Veterinary Clinics	25,867	161	
Private veterinary sector		NA	-	10
VETERINARY MEDICINES & BIOLOGICALS				
Production sector	Biological Production Units (Government - 21,Private - 8)	29	10	5
Retail sector	Pharmacies, Drug Sale point	NA	10	10
VETERINARY LABORATORIES				
National labs	CDDL, RDDL	6	6	3
Regional and local labs	Regional/ District Labs	256	16	36
Associated, accredited and other labs	ICAR Labs	6+31 FMD	10	9
Private veterinary laboratories	Integrated production companies e.g. poultry A number in main cities (companion animal only)	NA	-	-
ANIMAL AND ANIMAL PRODUCTS MOVEMENT CONTROL				
Bordering countries	Pakistan, China, Bangladesh, Nepal, Myanmar, Bhutan, Afghanistan	7	7	4
Airports and ports border posts	International Airports	34	10	3
Main terrestrial border posts		NA	-	3
Minor terrestrial border posts		NA	-	-
Quarantine stations for import	Animal Quarantine Certification Service	6	6	2
Internal check points	Rinderpest Check Post	186	14	3
Live animal markets		NA	-	5
Zones, compartments, export quarantines	Poultry Compartments Avian Influenza (without vaccination)	28	10	5
PUBLIC HEALTH INSPECTION OF ANIMALS AND ANIMAL PRODUCTS				
Export slaughterhouse	APEDA approved Slaughter Houses	80	10	5
National market slaughterhouses	Registered Slaughter Houses	1,783	-	5
Local market slaughterhouse		NA	-	10
On farm or butcher's slaughtering sites		NA	-	20
Processing sites (milk, meat, eggs, etc)	Milk Factories - 288 Milk Plants - 1559 Meat processing Plants - 28		-	16
TRAINING AND RESEARCH ORGANISATIONS				
Veterinary university	Veterinary University-14 Veterinary Colleges- 32	46	10	7
Veterinary paraprofessional schools	Paravet Training Centre/ Diploma School	224	15	10
Veterinary research organisations	ICAR Animal Science Institute	21	10	14

PART III: RESULTS OF THE EVALUATION & GENERAL RECOMMENDATIONS

This evaluation identifies the strengths and weaknesses of the veterinary services, and makes general recommendations.

FUNDAMENTAL COMPONENTS	
1.	HUMAN PHYSICAL AND FINANCIAL RESOURCES
2.	TECHNICAL AUTHORITY AND CAPABILITY
3	INTERACTION WITH INTERESTED PARTIES
4.	ACCESS TO MARKETS

The activities of the Veterinary services are recognised by the international community and by OIE Members as a '**global public good**'. Accordingly, it is essential that each country acknowledges the importance of the role and responsibilities of its Veterinary Services and gives them the human and financial resources needed to fulfil their responsibilities.

This OIE PVS Evaluation examined each critical competency under the 4 fundamental components, listed strengths and weaknesses where applicable, and established a current level of advancement for each critical competency. Evidences supporting this level are listed in Appendix 5. General recommendations were provided where relevant.

The current level of advancement for each critical competency is shown in cells shadowed in grey (15%) in the table.

III.1. Fundamental component I: human, physical and financial resources

This component of the evaluation concerns the institutional and financial sustainability of the VS as evidenced by the level of professional/technical and financial resources available and the capacity to mobilize these resources. It comprises fourteen critical competencies:

Critical competencies:

Section I-1	**Professional and technical staffing of the Veterinary Services**
	A. Veterinary and other professionals (university qualification)
	B. Veterinary para-professionals and other technical personnel
Section I-2	**Competencies of veterinarians and veterinary para-professionals**
	A. Professional competencies of veterinarians
	B. Competencies of veterinary para-professionals
Section I-3	**Continuing education**
Section I-4	**Technical independence**
Section I-5	**Stability of structures and sustainability of policies**
Section I-6	**Coordination capability of the VS**
	A. Internal coordination (chain of command)
	B. External coordination
Section I-7	**Physical resources**
Section I-8	**Operational funding**
Section I-9	**Emergency funding**
Section I-10	**Capital investment**
Section I-11	**Management of resources and operations**

Terrestrial Code References:

Points 1-7, 9 and 14 of Article 3.1.2. on Fundamental principles of quality: Professional judgement / Independence / Impartiality / Integrity / Objectivity / Veterinary legislation / General organisation / Procedures and standards / Human and financial resources.

Point 4 of Article 3.2.1. on General considerations.

Point 1 of Article 3.2.2. on Scope.

Points 1 and 2 of Article 3.2.3. on Evaluation criteria for the organisational structure of the Veterinary Services.

Point 2 of Article 3.2.4. on Evaluation criteria for quality system: “Where the Veterinary Services undergoing evaluation… than on the resource and infrastructural components of the services”.

Article 3.2.5. on Evaluation criteria for human resources.

Points 1-3 of Article 3.2.6. on Evaluation criteria for material resources: Financial / Administrative / Technical.

Points 3 and Sub-point d) of Point 4 of Article 3.2.10. on Performance assessment and audit programmes: Compliance / In-Service training and development programme for staff.

Article 3.2.12. on Evaluation of the veterinary statutory body.

Points 1-5 and 9 of Article 3.2.14. on Organisation and structure of Veterinary Services / National information on human resources / Financial management information / Administration details / Laboratory services / Performance assessment and audit programmes.

I-1 Professional and technical staffing of the Veterinary Services *The appropriate staffing of the VS to allow for veterinary and technical functions to be undertaken efficiently and effectively.* A. Veterinary and other professionals (university qualification)	Levels of advancement
	1. The majority of veterinary and other professional positions are not occupied by appropriately qualified personnel.
	2. The majority of veterinary and other professional positions are occupied by appropriately qualified personnel at central and state / provincial levels.
	3. The majority of veterinary and other professional positions are occupied by appropriately qualified personnel at local (field) levels.
	4. There is a systematic approach to defining job descriptions and formal appointment procedures for veterinarians and other professionals.
	5. There are effective management procedures for performance assessment of veterinarians and other professionals.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): Key informant interviews and JW8, JW12, JW14, JW15, JW16, JW18, JW19, JW29, JW32, JW36, JW37, JW49, JPW50, JW51, JPW55, JPW77, SRA37, SH3, SH6, SGU2, HP2, HP3, SP1, SP6, SK1, SK6, JPW4, JPW50, JPW55, JPW66, JPW77, HB7, HLB6, SKA11, P21JW, P13JW, P27JW, P31JW, P40JW,

Findings:

The majority of the professional veterinary positions at the DADF are occupied by registered veterinarians. However, there are several important vacancies at DADF including the lack of a Joint Commissioner and vacancies at Deputy Commissioner and Assistant Commissioner levels. These vacancies place extra burden on members of staff, who are often given additional duties beyond their normal responsibilities.

In most states the required veterinary positions are filled with well-qualified personnel. There are a number of states with multiple vacancies in the higher levels of government. In a number of states, for example Bihar, Assam and Jharkhand the position of director of the AHD is held by a non-veterinarian which adversely affects the technical leadership and support of the AHD.

At the senior levels of management within DADF and state AHDs many veterinary officers completed post-graduate studies, mostly MVSc but with some PhD degrees in a wide variety of disciplines. States sometimes now require that veterinary officers or assistant veterinary officers at the district hospitals or super speciality clinics have an MSc degree in clinical medicine, surgery or gynaecology as the minimum standard of education.

All veterinary positions, both in central and state governments have clear job descriptions. Discipline within the government veterinary services is maintained through rules of service and, to a lesser extent, through enforcement of the Standards of Professional Conduct, Etiquette Code of Ethics for Veterinary Practitioners Regulations, under the India Veterinary Council Act, and administered by State Veterinary Councils.

The range of clinical activities being provided at most larger urban district hospitals and clinics is being shaped by the movement of livestock out into the peri-urban regions and village areas surrounding the larger cities and towns. Thus, in most states, district hospitals and super speciality clinics have become equipped and specialised in providing routine and advanced clinical and surgical services to the pet owning public.

At the sub-district level, veterinary and animal production services are provided from ‘block’, or sometimes division level hospitals or dispensaries where there may be up to three veterinary officers and one or two veterinary para-professionals. Below the block level are dispensaries at the variously named, depending on the state, ‘mandal’, ‘gram panchayat’ or ‘tehsil’ levels of administration, consisting of clusters of several villages, where sometimes one veterinary officer and/or one or two veterinary para-professionals are deployed. The range of veterinary services changes markedly at these levels where veterinarians and veterinary para-professionals are fully engaged in providing routine clinical services in response to calls from

farmers as well as providing advice on preventive healthcare, supplying anthelmintics, insecticides, and vaccination services against anthrax, BQ, HS, sheep and goat pox, etc. as well as implementing the national disease control programmes (FMD-CP, PPR-CP, Brucellosis-CP, etc.).

State veterinarians are sometimes appointed as local magistrates and are regularly (up to 15/30 days per month in some districts of Jharkhand) required to assist the local authorities and law enforcement bodies to maintain law and order as well as managing food distribution to households below the poverty level and other forms of community work such as census and election duties. Such activities compromise the performance of their primary veterinary activities.

In addition to providing routine clinical services, district veterinary officers work with veterinarians and veterinary para-professionals at the block level and below, helping to organise and conduct livestock extension and vaccination camps and when required, provide supervision to the lower level field veterinarians and veterinary para-professionals.

At most district level hospitals and block level dispensaries routine preventive and clinical veterinary services and support services are well catered for in terms of numbers of staff available, vaccination targets and their case-loads. However, other core responsibilities including extension and awareness campaigns, movement control check-points, animal identification, livestock markets and disease surveillance are not being performed adequately. In the case of passive disease surveillance, it is likely that disease reporting is compromised due to lack of enforcement and also insufficient field coverage. (See also CCI-1 B).

There is evidence that the quality and quantity of veterinary services at the field level is compromised by a shortage of qualified veterinarians deployed at the lower administrative levels. This shortage of veterinarians leads to insufficient supervision of veterinary para-professionals, which amongst other issues may result in the lack of control over the prudent use of antimicrobial drugs.

To meet the recognised shortage of veterinarians, the number of veterinary colleges has been increased from 36 to 46 and admissions from 60 to 80 students in 17 veterinary colleges, following consideration of staffing levels and infra-structure.

The shortfall in numbers of field staff is also being addressed by the centrally funded ‘Establishment and Strengthening of Veterinary Hospitals and Dispensaries’ (ESVHD) scheme through which state AHDs purchase mobile veterinary clinics/ambulances, sometimes in collaboration with a variety of non-state actors, including GVK-Emergency Management and Research Institute (GVK-EMRI) and private philanthropists. These mobile clinics are often operated by veterinarians working under contract to the state AHDs, with funding also provided via the ESVHD or RKVY.

Staff recruitment centrally is by the Union Public Service Commission, with little direct line agency control. DADF develops terms of reference and recruitment rules (qualifications, age limits, etc.) which are sent for approval of the Union Public Service Commission, which manages the actual recruitment. A recruitment panel is formed with human resource and technical advisors. Approvals are required from the relevant ministry for junior positions and from the ‘Cabinet Ministry’ for positions at the level of Joint Secretary and higher. Deputisation (sideways movement) may only involve internal advertising. Similar rules apply at state level.

Promotion, although reported as being merit-based and considering annual appraisal, is based on seniority and service years as the main criteria. A number of illogical service rules apply that are causing bottlenecks and therefore vacancies at many levels, particularly in the technical veterinary service streams. For example, in a state in the north east, initial promotion within the technical stream was reported to require 25-30 years of service, and then additionally three years of service for any further promotion. As a result, all three technical leadership level positions (1 Director, 5 Additional Directors and 12 Joint Directors) are vacant, with the highest veterinary position occupied being a district officer equivalent. It was claimed that these service

rules were shortly to be changed but there was no evidence to confirm this. In direct contrast, within the parallel non-technical Indian Administrative Services (IAS) positions, there is a requirement to be moved to a new position every 3 years.

Staff evaluation is conducted annually via an appraisal report written by the line supervisor, which is also reviewed by his/her supervisor. This was written only (no interview) and did not involve any direct input from the staff member assessed, though there is an avenue of appeal for dissatisfied employees.

New recruits are required to undergo a lengthy two year probation period within which it is relatively easy to discontinue their employment. For employees over 50 years of age a recent change had allowed discontinuation of employment following 3 subsequent annual appraisals as a non-performer. However, between the initial probation period and the newer provision for those over 50 it was reported as being very difficult to terminate employment of public servants despite lack of performance.

The current veterinary/para-veterinary establishment (sanctioned positions) requirement at state AHDs is generally according to the recommendations provided by the National Commission of Agriculture (1976) based on approximately one veterinary service provider per 5,000 cattle heads. In many states the livestock numbers have increased considerably without any adjustment of staffing levels. When compared with the approved staffing level, three states had less than 60%, and eleven states have less than 75% of sanctioned posts filled (see Table 11)

Table 11: Veterinarians sanctioned posts and vacancies

State / Union Territory	Veterinarians in service[5]	Veterinarians required [6] (sanctioned post)	Percentage occupied
Andhra Pradesh	2006	2376	84.4
Arunachal Pradesh	175	175	100
Assam	812	1005	80.8
Bihar	1045	2052	50.9
Chhattisgarh	546	729	77.4
Goa	43	68	63.2
Gujarat	655	1149	57.0
Haryana	826	1230	67.2
Himachal Pradesh	451	573	78.7
Jammu & Kashmir	444	444	100
Jharkhand	562	791	71.0
Karnataka	2339	3120	75.0
Kerala	1500	1663	90.2
Madhya Pradesh	1163	1898	61.3
Maharashtra	2214	2634	84.0
Manipur	151	163	92.6
Meghalaya	233	255	91.3
Mizoram	105	116	93.9

[55] Figures provided by State DAHDFs during the PVS mission or from 2015 cited publication
[6] Figures according to National Commission of Agriculture (NCA) (1976)

State / Union Territory	Veterinarians in service[5]	Veterinarians required [6] (sanctioned post)	Percentage occupied
Nagaland	185	185	100
Orissa	931	1481	62.9
Punjab	1147	1423	80.6
Rajasthan	1952	3248	60.1
Sikkim	78	89	87.6
Tamil Nadu	2345	3351	70.0
Telangana	1030	1190	86.6
Tripura	170	348	48.8
Uttar Pradesh	1733	1984	87.4
Uttranchal	397	503	78.9
West Bengal	1173	1333	88.0
Andman & Nicobar (UT)	40	45	88.9
Chandigarh (UT)	5	5	100
Dadra Nagar Haveli (UT)	2	2	100
Daman & Diu (UT)	2	2	100
Delhi (UT)	54	58	93.1
Lakshadweep (UT)	10	15	66.7
Pondicherry (UT)	23	45	51.1

Strengths:

- All state veterinary universities and most colleges follow a standard curriculum and are compliant with standards set by the VCI
- Most central and state government posts are filled by well-qualified registered veterinarians, with many having obtained post graduate degrees

Weaknesses:

- 11/29 states the veterinarians in posts x sanctioned positions is less than 75%
- Induction training is not always given to newly appointed veterinarians
- Serious shortages of teaching staff at some less well-resourced veterinary colleges
- Few veterinarians have received sufficient training in applied epidemiology and related subjects, including risk analysis as applied to prioritisation for disease prevention and control programmes, food safety management systems, biosafety and biosecurity and quality assurance
- Shortages of field veterinarians contributes to a lack of supervision of veterinary para-professionals and poor disease surveillance coverage and outbreak investigations

Recommendations

- Review human resource needs –set up a national working group to review staff levels and training needs at DADF and state AHDs; revise sanctioned numbers as necessary
- Introduce merit-based system for promotion of veterinarians and other staff
- Set a minimum standard of having at least 95 of sanctioned professional / para-professional posts occupied at all times

I-1. Professional and technical staffing of the Veterinary Services *The appropriate staffing of the VS to allow for veterinary and technical functions to be undertaken efficiently and effectively.* B. Veterinary para-professionals and other technical personnel	Levels of advancement
	1. The majority of technical positions are not occupied by personnel holding appropriate qualifications.
	2. The majority of technical positions at central and state / provincial levels are occupied by personnel holding appropriate qualifications.
	3. The majority of technical positions at local (field) levels are occupied by personnel holding appropriate qualifications.
	4. The majority of technical positions are effectively supervised on a regular basis.
	5. There are effective management procedures for formal appointment and performance assessment of veterinary para-professionals.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): JW12, JW15, JW14, JW18, JW29, JW36, JW37, JW49, JW51, SRA7, SH6, SGU2, HP2, HP3, SP1, SP6, SK4, SK5, P30JW

Findings:

In most states the main cadre of veterinary para-professionals hold a two-year diploma obtained at one of several regional veterinary training centres, state agricultural training colleges or 'paravet' training schools following a curriculum approved by affiliated State Veterinary/Agriculture universities, sometimes in collaboration with senior veterinary officers based at the state AHD. Such diploma holders are variously referred to as animal health assistants, livestock extension officers or livestock assistants. In many states veterinary para-professionals are trained by various non-state actors, using courses of varying duration (see CCI-2B). There are also significant numbers of lesser qualified providers of animal health services including the extensive network of gopal mitras, primarily artificial insemination technicians with limited training in animal health.

The two-year diploma training provided to most veterinary-paraprofessionals has a strong bias towards animal production, milk production, breeding, nutrition and livestock management with little emphasis on disease recognition or clinical medicine. Most veterinary-paraprofessionals have training for them to perform their basic designated functions; there is a lack of sufficient technical knowledge and practical training. Disease surveillance is being compromised by the limited veterinary support for the veterinary para-professionals who have most contact with livestock keepers in the field and the failure to report all suspect notifiable disease events, such as abortions.

There are a number of categories of veterinary para-professionals working at the district, block and village levels; the position titles and roles vary by state. In some states (e.g. Tripura, Jharkhand, Mizoram) there are livestock assistants or technical assistants, also referred to as 'paravets', with only a one-year certificate. In other states there are 'paravets', sometimes also known as 'Multi-tasking Artificial Insemination Technicians of Rural India' (MAITRI) or as 'gopal mitras', who have undertaken a three or four month course focussing almost entirely on artificial insemination, breed improvement and animal production and almost no training on basic animal health or disease recognition. In some other states, veterinary para-professionals hold a diploma or certificate and are sometimes referred to as a veterinary pharmacist, veterinary supervisor, stockman or stock assistant, and such persons are permitted to only undertake 'minor veterinary services'. Overall training standards are variable and many 'paravet' have not had sufficient training on assessing clinical signs.

Locally, again varying by state, there are veterinary sub-centres, also referred to as artificial insemination centres, animal health centres, livestock aid centres or key veterinary units, from which state veterinary para-professionals provide vaccination services, artificial insemination, some routine clinical, disease prevention or livestock production activities including deworming, wound treatment, castrations and extension services related to breed

improvement, dairy production, fodder production, nutrition and management, under the supervision of the nearest veterinary officer at the block level.

Most artificial insemination technicians or gopal mitras are engaged by the state AHDs but in some states many are operating privately and not paid a salary but are supplied with a bicycle and equipment for artificial insemination and are expected to earn a living through providing artificial insemination services to farmers in a few villages; this income is very limited. Many of these (public and private) artificial insemination technicians supplement their income by providing routine clinical services sometimes using medicines provided by their supervising veterinarian but often obtaining both medicines and vaccines directly from local pharmacies. It was estimated that, across India, approximately 20-30% of veterinary drug use is via this informal, private gopal mitra system, a very significant proportion.

Although all categories of public and private veterinary para-professionals and artificial insemination technicians are officially required to work under the direct supervision of a veterinarian, in practice many veterinary para-professionals are actually working quite independently, providing private clinical services and dispensing medicines. The State Veterinary Councils are rarely made aware of such activities and thus regulations governing the practice of veterinary medicine by persons other than registered veterinarians are not being enforced. (See also CCs III-5 A & B).

At the central government level no information is available on the required numbers of veterinary para-professionals (sanctioned posts) in 3 UTs and 7 states. Of the remaining 26 states/UTs, 18/26 (69%) have less than 75% sanctioned veterinary para-professional posts filled and 11/26 (38%) have less than 60% posts filled. (see Table 12 below).

The reality is that the VS field animal health network of block hospitals, dispensaries and veterinary aid centres is not able to provide sufficient coverage of the livestock population (typically one veterinarian and 2-3 livestock extension officers for 10-15 villages) and therefore the gopal mitra system is providing clinical services in more remote areas on a fee-for-service basis.

Table 12: Veterinary para-professionals sanctioned posts and vacancies

State / Union Territory	Veterinary para-professionals in service [7]	Veterinary para-professionals required[8](sanctioned posts)	Percentage occupied
Andhra Pradesh	2263	3118	72.6
Arunachal Pradesh	630	NA	NA
Assam	2151	2506	85.8
Bihar	518	1223	42.4
Chhattisgarh	1447	NA	NA
Goa	113	NA	NA
Gujarat	880	1548	56.9
Haryana	2663	3167	84.1
Himachal Pradesh	2519	2731	92.2
Jammu & Kashmir	1750	NA	NA
Jharkhand	285	977	29.2
Karnataka	4764	6316	75.4
Kerala	2723	NA	NA

[7] Figures provided by State DAHDFs during the PVS mission or from central government AHD statistics
[8] Figures according to National Commission of Agriculture (NCA) (1976)

State / Union Territory	Veterinary para-professionals in service [7]	Veterinary para-professionals required[8](sanctioned posts)	Percentage occupied
Madhya Pradesh	3272	5795	56.5
Maharashtra	702	1048	67.0
Manipur	381	458	83.2
Meghalaya	471	471	100.0
Mizoram	105	260	40.4
Nagaland	295	NA	NA
Orissa / Odisha	2399	4045	59.3
Punjab	1701	2006	84.8
Rajasthan	7009	9663	72.5
Sikkim	497	NA	NA
Tamil Nadu	1538	2617	58.8
Telangana	1019	2067	49.3
Tripura	314	569	55.2
Uttar Pradesh	3892	5201	74.8
Uttranchal	876	1365	64.2
West Bengal	1447	4505	32.1
Andman & Nicobar	323	425	76.0
Chandigarh	16	16	100.0
Dadra Nagar Haveli	NA	NA	NA
Daman & Diu	NA	NA	NA
Delhi	34	110	30.91
Lakshadweep	NA	NA	NA
Pondicherry	33	109	30.28
TOTAL	49,030	62,316	

Strengths:

- DADF and state AHDs recognise importance of veterinary para-professionals and the need for good training
- Extensive network of veterinary para-professionals in position
- Two-year diploma for veterinary para-professionals is sufficient to carry out most routine responsibilities effectively.

Weaknesses:

- Insufficient numbers of veterinary para-professionals deployed in many states -16/26 states the veterinary para-professionals in posts x sanctioned positions is less than 75%
- Variable quality of training of veterinary para-professionals
- High level of autonomy, lack of veterinary supervision
- Lack of Veterinary Statutory Bodies to regulate all areas of veterinary para-professional activity

Recommendations:

- Review human resource needs –set up a national working group to review staff levels and training needs at DADF and state AHDs; revise sanctioned numbers as necessary
- Standardise training of veterinary para-professionals at all levels
- Consider bringing gopal mitras and other lower level (3-4 month trained) veterinary para-professionals into the animal health services system through upgrading their training
- Extend the VCI to include regulation of veterinary para-professionals or establish a separate Veterinary Statutory Body to regulate veterinary para-professional training and their activities
- Ensure adequate supervision by a registered veterinarian

I-2 Competencies of veterinarians and veterinary para-professionals *The capability of the VS to efficiently carry out their veterinary and technical functions; measured by the qualifications of their personnel in veterinary and technical positions.* A. Professional competencies of veterinarians including the OIE Day 1 competencies	Levels of advancement
	1. The veterinarians' practices, knowledge and attitudes are of a variable standard that usually allow for elementary clinical and administrative activities of the VS.
	2. The veterinarians' practices, knowledge and attitudes are of a uniform standard that usually allow for accurate and appropriate clinical and administrative activities of the VS.
	3. The veterinarians' practices, knowledge and attitudes usually allow undertaking all professional/technical activities of the VS (e.g. epidemiological surveillance, early warning, public health, etc.).
	4. The veterinarians' practices, knowledge and attitudes usually allow undertaking specialised activities as may be needed by the VS.
	5. The veterinarians' practices, knowledge and attitudes are subject to regular updating, or international harmonisation, or evaluation.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): Key informant interviews and JW9, JW12, JW13, JW14, JW37, JW44, JW64, JW66, JW58, SK2, SK18, P33JW

Findings:

Veterinarians receive a sound basic training using a standard national curriculum developed and approved by the VCI and leading to a Bachelor of Veterinary Science and Animal Husbandry (BVSc&AH). The syllabus for the course and the obligation to do a one year internship is uniform in all 59 veterinary colleges in the country. There is a high degree of professional competency for veterinarians to undertake their routine areas of activity, especially in clinical medicine and surgery and providing extension advice in livestock health, production, breeding and artificial insemination.

VCI sets standards and regulates veterinary undergraduate education as per the Minimum Standards of Veterinary Education Regulations 2016 (MSVER). The VCI has the authority to approve the facilities and standards available at veterinary universities and colleges. To regulate the standards of veterinary education and to ensure implementation of the MSVER, the Council carries out periodic inspections of the veterinary colleges assessing the facilities and the examinations leading to the award of BVSc&AH qualification.

Currently there are 46 VCI recognised veterinary colleges and 13 provisionally recognised veterinary colleges. Five veterinary colleges have had their approval suspended in the last 3 years due to insufficient numbers of faculty members to teach the number of enrolled students. Two veterinary colleges are awaiting approval by the VCI which is now being handled by an Advisory Committee established by the central government – as a temporary measure pending the re-establishment of the VCI Council. Degree qualifications of 13 foreign universities are also recognized by the VCI.

To meet the recognised shortage of veterinarians, the number of veterinary colleges has been increased from 36 to 46 and admissions from 60 to 80 students in 17 veterinary colleges, following consideration of staffing levels and infra-structure. However, not all colleges have the capacity in terms of faculty numbers, infrastructures and teaching facilities to comply with this notification. Admission in BVSc&AH degree course has also been allowed in six new veterinary colleges.

There is a shortage of teaching staff and facilities at some colleges. Of five veterinary universities surveyed in 2015[9] there were found to be 1,115 available of the recommended (VCI norms) 1,900 faculty staff, indicating a shortfall of approximately 40%. One veterinary

[9] Rev. Sci. Tech. Off. Int. Epiz. 2015 34 (3) 767-777

college in Jharkhand had only 21 positions filled out of a recommended faculty of 131 sanctioned posts; this shortfall was being partly offset through the award of teaching contracts to retired professors and other teaching associates.

Some recently established veterinary colleges and older colleges have insufficient funding for maintenance and replacement of facilities and equipment or to hire sufficient numbers of staff so the training standards are compromised. It has also been suggested that the standard veterinary degree curriculum, revised in 2016, could have been developed with greater consultation between the VCI and the state AHDs, who remain the main employer of veterinary graduates. It is said that revised curriculum does not sufficiently provide the veterinary knowledge and skills required in areas such as extension and specialist knowledge on more intensive livestock management and production systems. There is also a recognised need to increase collaboration and linkages between state veterinary universities, the Indian Council of Agricultural Research (ICAR), veterinary colleges, directorates of extension to determine the needs of livestock keepers, and both professional and veterinary para-professional service providers.

Specialist skills in virology, bacteriology and biotechnology are widespread and of a high standard. There is little knowledge of epidemiology especially as it is applied to analysis of animal disease information, risk analysis for prioritisation of disease prevention and control and the implementation of disease surveillance programmes. Few laboratory veterinarians have been trained in the required standards for quality assurance, biosafety and biosecurity and good laboratory practices (GLP). Very few veterinarians in the state veterinary services have been provided with advanced training on the application of food safety management systems or food safety of animal products (ante- and post-mortem inspection).

ICAR situated within the Department of Agriculture Research and Education (DARE) sets standards for research and regulates post-graduate training of veterinarians (Masters and PhD degrees) as well as having a role in the regulation of all agricultural universities and colleges. In this respect, the ICAR sets the All India Common Entrance Examination for entry for the 15% quota of university places which are allocated to support ‘All India’ veterinary students.

In many states induction training of varying length is provided to newly recruited veterinarians however such training programmes are not always implemented according to a well-planned training programme. In many cases, veterinarians are expected to learn their duties on-the-job.

Strengths:

- All state veterinary universities and most veterinary colleges follow a standard curriculum and are compliant with standards set by the VCI
- Most veterinarians graduate from VCI approved veterinary universities and colleges with the current approved Day 1 competencies.

Weaknesses:

- Inadequate knowledge and skills of mid-level veterinary officers to carry out effective animal production and health extension services
- Insufficient collaboration between institutions involved in setting standards for veterinary education and training
- Insufficient knowledge and skills of specialist subjects such as epidemiology, risk analysis, laboratory quality assurance and food safety, that is current Day 1 competencies are insufficient in these areas

Recommendations:

- Review of Day 1 competencies of veterinarians to address weaknesses in professional competencies and gaps in the curriculum
- Develop and implement planned programmes for pre-service, in-service and basic induction and continuing education courses to increase veterinarians' knowledge and skills
- Introduce specialist training in critical skills such as epidemiology and risk analysis
- Review and revise veterinary degree and diploma curricula to reflect the needs of field veterinarians working in the field

B. Competencies of veterinary para-professionals	Levels of advancement
	1. The majority of veterinary para-professionals have no formal entry-level training.
	2. The training of veterinary para-professionals is of a variable standard and allows the development of only basic competencies.
	3. The training of veterinary para-professionals is of a uniform standard that allows the development of only basic specific competencies.
	4. The training of veterinary para-professionals is of a uniform standard that allows the development of some advanced competencies (e.g. meat inspection).
	5. The training of veterinary para-professionals is of a uniform standard and is subject to regular evaluation and/or updating.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): Key informant interviews JW6, JW7, JW9, JW12, JW13, JW14, JW37, JW59, JW60, JW61, JW62, JW63, JW64, JW65, JW66, JW68, JW69, SH4, SH5, JPW7, JPW11, JPW78, HP4, HP6, HP7, P12JW, P14JW, P15JW, P16JW, P23JW, P24JW, P25JW

Findings:

Senior level veterinary para-professionals are provided with a relatively standard two-year diploma training course at regional animal husbandry training centres, veterinary officers training institutes and veterinary colleges in each of the 29 states throughout India. In most states additional induction/in-service training is provided at the same or various other training establishments. In many states trainings are being conducted under the ASCAD programmes or within an informal continuing education framework but on a regular basis in order to maintain trained manpower all over the country. In many states, veterinary para-professionals are being trained by a variety of NGOs (e.g. BAIF (Bharatiya Agro Industries Foundation) Development Research Foundation, Krishi Gram Vikas Kendra (KGVK) and the Kayastha Pathshala (KP) Trust etc.), for varying duration of courses and using different veterinary para-professional titles and terminology. Most NGO trained veterinary para-professionals go on to work privately, with variable levels of professional supervision. BAIF has its own veterinary para-professional training schools.

Most veterinary para-professionals trained to the level of a two-year diploma are employed by state AHDs and are adequately qualified to carry out the limited range of veterinary activities defined as 'minor veterinary services' in the Indian Veterinary Council Act (1984), which includes provision of first aid and minor surgical interventions such as bloodless castration, prophylactic vaccination of animals and the administration of drugs, strictly as prescribed by a registered veterinary practitioner. In practice, most veterinary para-professionals use injectable antibiotics under the supervision of the veterinary doctor working from the block/lower level hospital/dispensary overseeing their activities. However, it was widely recognised that veterinary para-professionals often work independently and do not necessarily respect the regulations governing the prudent use of prescription only medicines.

Some categories of veterinary para-professionals are trained to perform artificial insemination only and many have become skilled and achieve high conception rates.

Veterinary para-professionals are also trained to collect samples of milk, blood, swabs from wounds, injuries and pathological lesions, urine, faeces, milk and semen for submission to their nearest veterinary diagnostic laboratory. They participate in surveillance programmes supporting disease control by undertaking pre and post vaccination monitoring by collecting, processing and dispatching diagnostic samples.

There is considerable variation between the states in the duration and quality of training provided to veterinary para-professionals. In some states, in addition to the two-year diploma, some veterinary para-professionals have been provided with one year training for the Certificate in Animal Health and Production. There are also shorter courses ranging from 3–6 months, particularly if veterinary para-professionals are trained for specific purposes such as artificial insemination. In other less well-funded states (e.g. Tripura. Mizoram and Jharkhand) some Agricultural Training Colleges provide 3 to 4 month courses to private candidates on providing artificial insemination services. In some cases, these private technicians supplement their income by providing clinical services including providing treatments, without necessarily working under the supervision of a registered veterinarian, with consequent concerns over the prudent use of prescription only medicines.

Strengths:

- Relatively uniform training for veterinary para-professionals through two-year diploma courses
- Some induction/in-service training available depending on availability of funding
- Two-year diploma veterinary para-professionals are competent to carry out the approved range of basic veterinary interventions, under supervision of registered veterinarians
- Many veterinary para-professional training institutes with capacity to provide good quality training to veterinary para-professionals.

Weaknesses:

- No formal programme for in-service training for veterinary para-professionals in most states
- Limited opportunity to progress to a higher level of employment
- Wide range of nomenclature, quality and levels of training throughout India

Recommendations:

- Develop formal programme for needs-based in-service training to enhance knowledge and skills
- Provide ongoing training on recognition and reporting of notifiable diseases
- Provide opportunities for veterinary para-professionals to undertake degree level training
- Under the VCI or equivalent, develop standardised training programmes and standardise the titles to be used by different categories of veterinary para-professionals throughout India

I-3 Continuing education (CE)[10] *The capability of the VS to maintain and improve the competence of their personnel in terms of relevant information and understanding; measured in terms of the implementation of a relevant training programme.*	Levels of advancement
	1. The VS have no access to veterinary, professional or technical CE.
	2. The VS have access to CE (internal and/or external programmes) on an irregular basis but it does not take into account needs, or new information or understanding.
	3. The VS have access to CE that is reviewed annually and updated as necessary, but it is implemented only for some categories of the relevant personnel.
	4. The VS have access to CE that is reviewed annually and updated as necessary, and it is implemented for all categories of the relevant personnel.
	5. The VS have up-to-date CE that is implemented for all relevant personnel and is subject to regular evaluation of effectiveness.

Terrestrial Code reference(s): Appendix 1

Evidence: SM3, SM4, JW14, SKA11, SKA18, SKA20, JPW7, JPW11, JPW18, JPW73, JW13, JW14, JW37, SG48,

Findings:

Throughout India there is a wide variety of veterinary faculties, colleges, agricultural training centres, polytechnics, research centres etc. each providing a range of different short courses available for veterinarians and veterinary para-professionals. At DADF and the state AHDs, staff only attend such courses as and when funding is available on an irregular basis and there is no structured training plan; some of the courses available are not necessarily based upon the actual training needs of the veterinarians or veterinary para-professionals.

It is reported that there are some fundamental issues as undergraduate training is not catering for all of the training needs of veterinary graduates or veterinary para-professionals. CE can partly be used as a tool to rectify lack of knowledge and skills. There has not yet been any needs assessment to identify priorities and to develop a CE development programme.

The VCI Act and Rules do not yet have any provisions for introducing a mandatory CE requirement for the five-early renewal of registration. It has been proposed that such a scheme should be introduced on a five-yearly basis coinciding with the re-registration requirements. Some states are introducing mandatory CE for re-registration. For instance, the Punjab has introduced a requirement for a minimum of 15 credit points equivalent to three or four CE courses for renewal of registration and in Karnataka although CE is currently voluntary (2017/18) so far six CE training courses have been organised by the State Veterinary Council, with a total of 425 registered attendees.

Many veterinarians lack specialised training especially in the areas of veterinary public health, epidemiology and risk-based planning, the design and implementation of disease surveillance and control programmes and the delivery of information, education and communications. Similarly, many veterinary para-professionals have not had sufficient training in disease recognition and reporting of notifiable animal diseases.

ICAR institutes have very extensive training programmes including topics such as epidemiology, risk analysis, disease modelling, laboratory diagnostics and practices. The Centre for One Health Education, Advocacy, Research and Training (COHEART) at the University of Kerala provides training courses in One Health and Food Safety, which are based on a recent training needs assessment in the area of veterinary public health.

All veterinary staff employed at central and state AHDs are eligible for release of up to five years during their employment to follow MSc and PhD courses. Such post-graduate students

[10] Continuing education includes Continuous Professional Development (CPD) for veterinary, professional and technical personnel.

are paid an allowance sufficient to cover living costs and fees as an incentive to further their knowledge and skills.

Under the National Action Plan (2016/17 to 2020/21) the 'Professional Efficiency Program' is aiming to provide CE to some 27,000 veterinarians at a cost of more than 60 million INR.

Strengths:

- Wide variety of short courses being provided to veterinarians and veterinary para-professionals
- Some courses address identified training needs
- Funding is available to provide training opportunities for veterinarians and veterinary para-professionals
- Significant investment in CE proposed under the National Action Plan

Weaknesses:

- Many veterinarians and veterinary para-professionals lack the necessary knowledge and skills to perform more specialised functions and activities
- State AHD don't have a formal well-planned CE programme to maintain and upgrade the knowledge and skills of veterinarians and veterinary para-professionals
- Many training courses provided are not based on actual training needs
- No provisions for a mandatory CE requirement for the renewal of veterinary registration

Recommendations:

- Review human resource and training needs – set up a national working group to review staff levels and training needs at DADF and state AHDs
- Review curricula to upgrade the Day 1 competencies of veterinarians and veterinary para-professionals to meet required competencies and professional standards
- Introduce mandatory CE for registration with State Veterinary Councils and VCI
- Each state AHD to develop and implement a formal CE programme for veterinarians and veterinary para-professionals based on training needs
- Develop a mandatory CE programme based on 'credits'; the programme should recognise attendance at seminars, conferences, short courses, etc. and self-learning projects, to fulfil the programme requirements

I-4 Technical independence *The capability of the VS to carry out their duties with autonomy and free from commercial, financial, hierarchical and political influences that may affect technical decisions in a manner contrary to the provisions of the OIE (and of the WTO SPS Agreement where applicable).*	Levels of advancement
	1. The technical decisions made by the VS are generally not based on scientific considerations.
	2. The technical decisions take into account the scientific evidence, but are routinely modified to conform to non-scientific considerations.
	3. The technical decisions are based on scientific evidence but are subject to review and possible modification based on non-scientific considerations.
	4. The technical decisions are made and implemented in general accordance with the country's OIE obligations (and with the country's WTO SPS Agreement obligations where applicable).
	5. The technical decisions are based only on scientific evidence and are not changed to meet non-scientific considerations

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SG1, HLB6

Findings:

The Animal Husbandry Commissioner and the State Commissioners for Animal Husbandry are the most senior technical positions in the chain of command within the central and state veterinary authorities of India, that are occupied by a qualified veterinarian. The AHC is the de facto Chief Veterinary Officer of the country and State Commissioners are the de facto CVOs of each State.

Officers of the Indian Administrative Service (IAS) hold the senior management positions in both central and state governments; these IAS managers seem to be rotated regularly (e.g. every three years) to broaden their management experience. This organisational structure results in the Secretary, a high level manager rather than a technical specialist, being the OIE delegate.

Line management of technical staff at DADF is by the Secretary through the Joint Secretary (both IAS) to the Joint, Deputy and Assistant Commissioners. The AHC position is described as 'advisory'. Similar complex dual structures also exist at the state levels, with some variations on the levels of the VS technical and IAS streams. However, most states have a Director (or Acting Director) who is a veterinarian. The AHC and State Commissioners of the AHDs emphasised that decisions followed their technical advice.

At the programme level, veterinarians have a good capacity to provide technical inputs on national animal health schemes, and that these schemes are generally well resourced via IAS management decisions. For example, major expansion of the FMD and PPR vaccination campaigns have been approved targeting full national coverage. This does not diminish the need that much stronger epidemiological input into all surveillance and disease control programmes.

Another aspect of the administrative structure is that India's level of engagement with OIE is sometimes limited by correspondence not reaching the appropriate technical staff for their considered inputs (see CCIII-3 Official Representation). However, India has a good track record for providing its routine periodic and ad hoc reports to the OIE / WAHIS. The accuracy of the routine animal health status reports is questioned with the limitations of surveillance system (see CCII-5).

Technical decisions made by state AHCs are usually based upon sound scientific principles, however, there is insufficient use made of risk analysis using disease surveillance and control programme information and there are no formal risk analysis teams established to help with planning and management of disease surveillance for existing disease prevention and control programmes. Note that the NADRES programme utilises a risk-based approach to disease prediction and this provides states with early warning of high-risk periods.

The technical decisions on sanitary measures to be applied to imported animals and animal products made by AQCS officers are always adhered to by the Secretary, DADF. The standards set for the sanitary measures to be applied to imported animals, animal products and other restricted biologicals and controlled articles, are based on sound scientific justification. Some risk analysis is used to determine required sanitary measures, which are always in line with OIE and other international standards.

Animal health requirements for export certification of meat and other animal products is undertaken by official veterinarians appointed by the state AHD under delegation from the central government and thus is under the authority of the AHC. Export certification is conducted in a transparent manner, respecting the requirements of importing countries and in accordance with international norms, using OIE standard international veterinary certification forms.

The technical independence of staff is well managed in India. All veterinary positions, both in central and state governments have clear job descriptions and discipline within the government veterinary services is maintained through rules of service and, to a lesser extent, through enforcement of the Standards of Professional Conduct, Etiquette & Code of Ethics for Veterinary Practitioners Regulations, under the India Veterinary Council Act, and administered by the VCI and State Veterinary Councils. Salary levels of veterinarians and veterinary para-professionals are good, so there is little risk to technical independence based on a need or incentive to supplement income. The situation of secondary employment of government veterinarians is complicated with some states paying their veterinarians a 'non-practicing allowance'. Where this is not paid veterinarians are free to practice outside working hours to supplement their income, with many veterinarians running private practice from their homes. This practice is a risk in terms of independence and misuse of government resources – drugs and equipment.

A 'vigilance unit' has also been established within the DADF to monitor the performance of staff and to process vigilance cases against the Department and its subordinate offices. A Chief Vigilance Officer monitors the vigilance cases on a regular basis. In October – November 2016 the Department along with its field units observed a 'Vigilance Awareness Week; during which the theme was 'Public Participation in Promoting Integrity and Eradicating Corruption'.

There is a lack of merit-based recruitment and promotion, and this is resulting in poor use of technical expertise and a high number of vacancies in the technical stream. As an extreme example, in one state the top three levels of the technical VS (Director, Additional Directors and Joint Directors), some 18 positions, were all vacant, due to impractical length of service rules which severely curtailed opportunities for veterinary promotion (e.g. 25-30 years before the first promotion, then 3 years services per promotion thereafter). Many states had similar vacancies in senior veterinary positions due to such service rules. As a contrast, IAS management is generally required to rotate every 3 years, which questions the level of specialised knowledge and commitment available from the administrative side of the VS.

Strengths:

- Technical decisions made by officers of central and state veterinary services are made on the basis of sound scientific evidence
- There is no reported political interference in technical decision making
- Strict rules for staff behaviour and conduct and the establishment of a 'vigilance unit'

Weaknesses:

- The technical and administrative structures at DADF and state AHDs present a risk to technical independence due to a lack of a technical chain of command
- Limited opportunities for veterinary promotion compromise the use of specialist skills, technical independence and decision making.

Recommendations:

- Review the technical and administrative structures at DADF and state AHDs to provide stronger line authority for technical decision making and a clear technical chain of command
- Review promotion practices and adopt a merit-based approach to maximise technical skills and decision making

I-5 Stability of structures and sustainability of policies *The capability of the VS structure and/or leadership to implement and sustain policies over time.*	Levels of advancement
	1. Substantial changes to the organisational structure and/or leadership of the public sector of the VS frequently occur (e.g. annually) resulting in lack of sustainability of policies.
	2. Sustainability of policies is affected by changes in the political leadership and/or the structure and leadership of VS
	3. Sustainability of policies is not affected or is slightly affected by changes in the political leadership and/or the structure and leadership of VS.
	4. Policies are sustained over time through national strategic plans and frameworks and are not affected by changes in the political leadership and/or the structure and leadership of VS
	5. Policies are sustained over time and the structure and leadership of the VS are stable. Modifications are based on an evaluation process, with positive effects on the sustainability of policies.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SM19, SG1, SG5, JPW86, JW14, JW68

Findings:

India has one of the largest livestock populations in the world and a very high level of small holder livestock ownership. The national and state governments of India recognise the importance of the agricultural sector and have continuously provided strong policy support emphasising the need for economic growth and food safety. All governments, state and national, provide substantial and ongoing investment into all aspects of livestock production.

To make farming a 'remunerative profession' the Rashtriya Krishi Vikas Yojana (RKVY) programme was iniated in 2007 with an initial funding of 58.7 billion INR to be provided annually. Recently the programme has been revised and is now officially referred to as the Rashtriya Krishi Vikas Yojana - Remunerative Approaches for Agriculture and Allied sector Rejuvenation (RKVY-RAFTAAR). This programme focuses on value chain, post-harvest infrastructure and 'agri-entrepreneur' development and is being implemented over two years till 2019-20 with a budget allocation of 157 billion INR. The RKVY supports VS infrastructure and service delivery in the states.

Under the 12th Five Year Plan (to 2017) the demand for increased protein foods was identified as a major driver for the growth of livestock production. Emphasis was placed on the need to work with smallholders and landless farmers as these accounted for the majority of livestock owners. Major challenges were acknowledged including the need for the effective control of animal diseases along with improved nutrition and husbandry; opportunities were identified to improve dissemination of technology, skills and quality management for the animal health services.

Under the constitution DADF has the mandate to protect and promote livestock farming and production nationally, including maintaining national biosecurity and border control, to cooperate with international organisations, and to operate as the Veterinary Authority of India.

DADF restructured its Centrally Sponsored Schemes for the 12th Five Year Plan, launching the 'National Livestock Mission' to support growth of the livestock sector with the main objective of achieving sustainable development by providing greater flexibility to states in implementing livestock schemes. An amount of 28,000m INR was allocated to the National Livestock Mission. One element of the National Livestock Mission is the 'Risk Management and Insurance' programme that has been implemented since 2014; under this programme livestock owners may insure up to a maximum of five animals and are paid out in case of death of the livestock following veterinary certification and autopsy; an added benefit is that insured animals have to be identified.

DADF also launched a series of 'National Control Programmes' to combat major animal diseases including FMD, PPR, brucellosis and CSF. Taking the FMD control programme as an example, this programme has been implemented across the country progressively as

vaccine supplies improved and is now implemented nationally (see CCII-7). Similarly, PPR and brucellosis control programmes are being implemented in all states/UTs, whereas CSF control focuses on the north east. 31,140m INR was allocated to the control programmes.

To support the programmes to improve livestock health DADF have worked with the states/UTs to provide better health care through 'Polyclinics', Veterinary Hospitals, Dispensaries and First-Aid Centres including Mobile Veterinary Dispensaries. Laboratory services have also been progressively developed with the introduction of the Regional Disease Diagnostic Laboratories (RDDLs), which are now fully functional, in addition to specialist national laboratories and state diagnostic laboratory services.

A series of ongoing ASCAD schemes are being implemented and are listed in Section II.3B.

In addition, DADF has a 'National Action Plan for Livestock Health' which seeks to prevent disease incursions and to be prepared if such an incursion occurs. The main focus of the plan has been on avian influenza with many documents and activities being developed since 2012/13.

Review of the budget and expenditure for the 12th Five Year Plan indicates that budget utilisation for the period was over 92% indicating a high level of commitment to budget delivery and the completion of programme activities.

The structure and functions of the VS at national (DADF) and state/UT levels has remained unchanged since the formation of DADF in 1991 (fisheries were added in 1997); states/UT departments have also undergone minor organisational changes with their capabilities and resources steadily increasing.

The senior technical officer of the VS in India is the 'Animal Husbandry Commissioner', *aka* the Chief Veterinary Officer. The Animal Husbandry Commissioner is not the OIE delegate as this position is held by the 'Secretary' the most senior civil servant of DADF, a member of the Indian Administrative Service (IAS). Senior positions at DADF including the position of Animal Husbandry Commissioner rotate approximately every five years. These positions are not subject to change by political leaders.

ICAR has an extensive network of research facilities, laboratories and farms and works closely with DADF and the state AHDs to support programme development and delivery. ICAR is long established, well-funded and provides and provides stable and sustainable support to the delivery of animal health programmes in the country.

Structures that support the delivery of VS nationally include the Veterinary Council of India, the Animal Welfare Board of India and the National Dairy Development Board, all are well established and have operated consistently and sustainably over many years.

Strengths:

- Government has a strong policy and budget commitment to agriculture including livestock production; ongoing support of RKVY; animal health budget is increasing year on year
- National strategic plan for livestock health
- DADF and state AHDs are not subject to changes with changes to the political leadership
- Most ASCAD and specific disease control schemes have been implemented for several years with increasing budgets and coverage
- ICAR has been long established and provides ongoing research and support for the national livestock production and animal health programmes

Weaknesses:

- No robust evaluation process of programmes and their effectiveness and efficiency
- Senior officers at DADF and state AHDs are administrative staff (IAS) with short term (three year) tenures in the VS

Recommendations:

- Implement rigorous independent evaluation of programmes and their effectiveness and efficiency
- Seek greater role for veterinarians in senior management at DADF and state AHDs

I-6 Coordination capability of the Veterinary Services A. Internal coordination (chain of command) *The capability of the VS to coordinate its resources and activities (public and private sectors) with a clear chain of command, from the central level (the Chief Veterinary Officer), to the field level of the VS in order to implement all national activities relevant for the Codes (i.e. surveillance, disease control and eradication, food safety and early detection and rapid response programmes).*	Levels of advancement
	1. There is no formal internal coordination and the chain of command is not clear.
	2. There are internal coordination mechanisms for some activities but the chain of command is not clear.
	3. There are internal coordination mechanisms and a clear and effective chain of command for some activities.
	4. There are internal coordination mechanisms and a clear and effective chain of command at the national level for most activities.
	5. There are internal coordination mechanisms and a clear and effective chain of command for all activities and these are periodically reviewed/audited and updated.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): JPW86, JPW2, JPW8

Findings:

India is a large federal country with a large economically and culturally significant livestock sector. The VS are commensurately very large with operations at national, state/UT, and sub-state and local levels. In addition, there are an array of private sector players in the VS – private practices, large private livestock production companies (particularly poultry) with their own animal health services, and private vaccine and pharmaceutical manufacturing companies. There are also large numbers of national and regional/state NGOs and para-statals providing or supporting the delivery of veterinary services.

Under the constitution veterinary services and animal health are state mandates. Nationally DADF is required to protect and promote livestock farming and production, including maintaining national biosecurity and border control and to cooperate with international organisations. DADF 'advises' State Governments/Union Territories on the formulation of policies and programmes in the field of Animal Husbandry, Dairy Development and Fisheries.

In addition to supporting the national initiatives as set by DADF, each state has the autonomy to implement state run schemes including the delivery of general VS in their state and to implement specific state priority disease control programmes. Each department of animal husbandry at state level is headed by a cabinet ranked minister for animal husbandry who oversees and enforces all decisions and policies of both the central government and the state.

Technical leadership is provided nationally by the AHC of DADF and he/she has the authority to guide animal health policies and programmes along with the senior IAS staff, the Secretary and Joint Secretaries. The AHC has a team of technical support staff working with him/her (Joint Commissioners, Deputy Commissioners, Assistant Commissioners and Livestock Officers) at central level to carry out the programmes and schemes; these technical staff do not report to the AHC but to a Joint Secretary, an IAS (non-veterinary) staff member. The chain of command works in DADF though owing to the matrix management approach and absence of direct line management there is a risk of compromises being made.

DADF develops national policies and programmes and provides the leadership and significant funding support for the core programmes – usually funded at 60:40 central to state but in the Himalayan states and the northeast this ratio is increased to 90:10; the UTs are funded 100% by central government. In addition, policies and funding for emergency responses are paid for by central government, with states sometimes choosing to increase the rate of compensation (usually 70% of market value – but this can be increased to 100% for HPAI and glanders). These funding arrangements give DADF a strong mandate for control of priority national programmes and emergency responses at state level.

Coordination between central government and the states/UTs is through a combination of regular national meetings of the AHC with all state/UT directors and quarterly regional face to face meetings held between the AHC, his/her senior staff and the state/UT directors. This collaboration and coordination is supported by video-conference meetings held as required, usually at least quarterly.

The National Informatics Centre (NIC) has provided video links to every district and so this means of communication is readily available. These meetings are formal with a prepared agenda, minutes and a meeting report.

State AHD personnel also use the video-conference facilities for regular meetings with their district staff. This approach allows for changes to be introduced in a uniform manner across the state.

Web-based, high definition video services were launched in January 2011 for point to point and multi-point conferencing using desktop computers. Laptops, desktops, tablets, smart phones, room systems and older equipment may all use this system.

In addition to these video-conferences, there are also quarterly face to face meetings between the AHC, the Secretary and Joint Secretary and the state AHD Directors to continually monitor the state performance. There is also one annual review meeting held for each region.

ICAR have a very extensive network of research centres and specialist laboratories that work closely with DADF providing high level diagnostics including for FMD (Mukteshwar), equine diseases (Hisar) and AI/HPAI (Bhopal). The Regional and State Disease Diagnostic Laboratories (R/SDDLs) coordinate with these specialist facilities to provide disease confirmation or high level disease characterisation using molecular techniques. In addition, other ICAR facilities work with DADF to provide additional expertise in animal health and production; ICAR Animal Science Division operates from 19 institutes across the country covering all major animal species including camels, mithun and yaks. The focus of ICAR is on animal production but considerable ongoing research is investigating disease epidemiology and developing improved diagnostic tests.

ICAR-National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI) in Bengaluru provides the national lead in disease epidemiology and informatics and implements the Animal Disease Monitoring and Surveillance (ADMAS) surveillance programme. Currently there is little coordination between the NIVEDI-ADMAS programme and the NADRS programme operated by DADF. NIVEDI also implements the NADRES programme for predicting high risk disease periods. These predictions are provided to each state as they become available (see CCII-5).

The ‘Chaudhary Charan Singh National Institute of Animal Health’ (CCSNIAH) is to become the reference laboratory for setting standards and testing veterinary biologicals. It is under the management of DADF. This will be a change from the current system in which IVRI-Bareilly provides this quality assurance service. It is understood that this change has been approved and will take place seamlessly.

Animal Quarantine and Certification Service (AQCS) has extensive coordination responsibilities as it manages border inspections as well as providing quarantine for incoming animals or products. AQCS also ensure that products exported from India comply with trading partner/international standards. AQCS are managed by DADF but work closely with the Trade Department of DADF and with Agricultural and Processed Food Products Export Development Authority (APEDA) and Export Inspection Council (EIC).

At field level some states are developing programmes in consultation with their field staff. For example, in Kerala veterinarians have meetings at village level to assess the needs of the livestock owners. These proposals are compiled by the district office and from all districts the proposals are then evaluated and selected for submission to RKVY by the state AHD director.

Strengths:

- Excellent internal coordination with an effective chain of command
- Chain of command is reinforced by central programme funding mechanism
- Organisational charts available; staff have clearly defined roles and responsibilities

Weaknesses:

- Some limitations in coordination/lines of command between technical and administrative staff (see also CCI.4)
- The federal structure of India and the delegation of activities to state AHDs can lead to a lack of consistency
- Lack of inter-state meetings and development of joint programmes
- Lack of on the ground inspection and monitoring in states by central VS staff

Recommendations:

- Improve state reporting to increase ability to review programmes and ensure consistent and effective programme delivery
- States should regularly exchange animal health and production information and also hold regular inter-state meetings
- Introduce audits of states activities by central staff

B. External coordination	Levels of advancement
The capability of the VS to coordinate its resources and activities (public and private sectors) at all levels with other relevant authorities as appropriate, in order to implement all national activities relevant for OIE Codes (i.e. surveillance, disease control and eradication, food safety and early detection and rapid response programmes). Relevant authorities include other ministries and Competent Authorities, national agencies and decentralised institutions.	1. There is no external coordination.
	2. There are informal external coordination mechanisms for some activities, but the procedures are not clear and/or external coordination occurs irregularly.
	3. There are formal external coordination mechanisms with clearly described procedures or agreements for some activities and/or sectors.
	4. There are formal external coordination mechanisms with clearly described procedures or agreements at the national level for most activities, and these are uniformly implemented throughout the country.
	5. There are national external coordination mechanisms for all activities and these are periodically reviewed and updated.

Terrestrial Code reference(s): Appendix 1

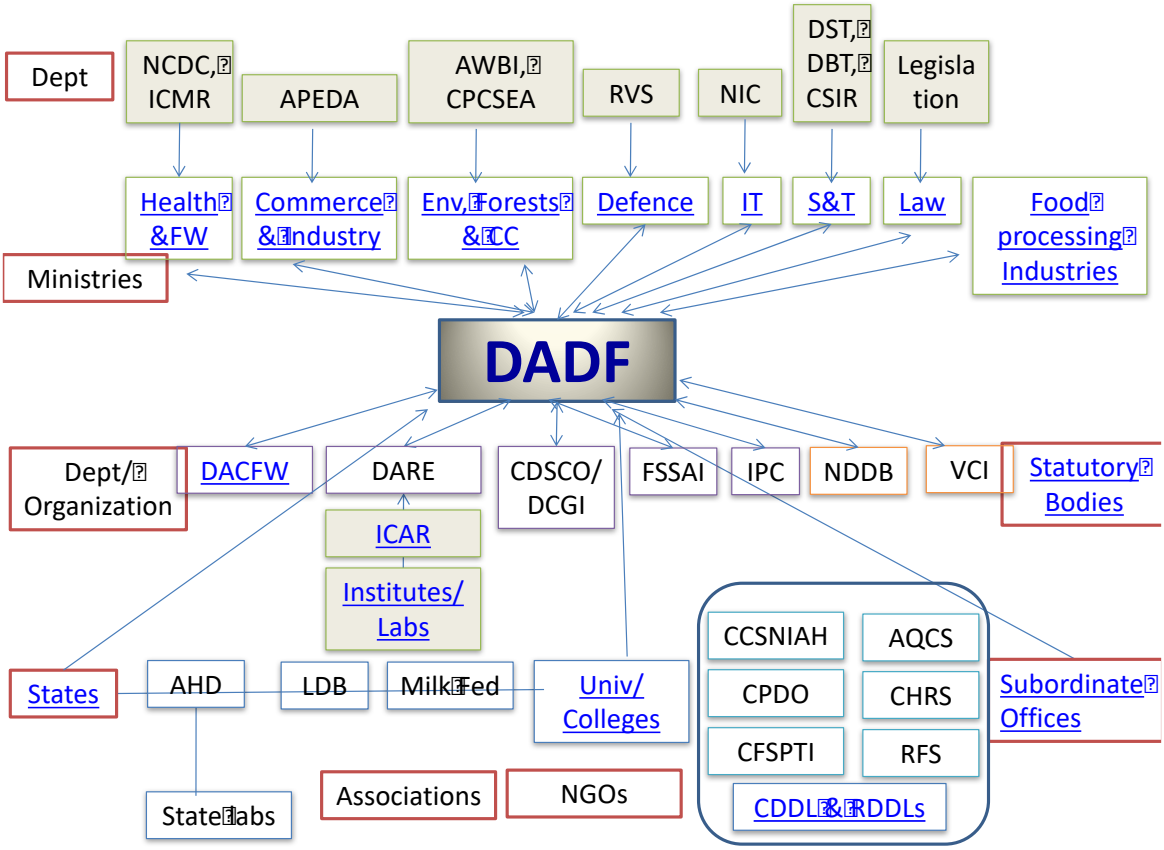
Evidence (listed in Appendix 5): JPW86, SG17-30, SG37, JPW16, SH2

Findings:

National

At national level, DADF have a strong network for communication and engagement with a number of 'Competent Authorities' and other national agencies and institutes. DADF has an organogram of its links with other departments (of the Ministry of Agriculture and Farmers Welfare), other ministries and their departments, statutory bodies and with the states/UTs.

Figure 6: Network diagram of DADF external coordination



External coordination mechanisms are in place between DADF and other relevant authorities with formal meetings are held regularly and minutes and reports prepared. Some key examples are provided here:

Ministry of Health and Family Welfare (MoH&FW)

DADF and MoH&FW coordinate at multiple levels and with a range of activities with MoH&FW departments and organisations including:

- The National Centre for Disease Control (NCDC) on zoonoses control including HPAI and rabies; DADF sits on the 'Standing Committee on Zoonoses';
- The Indian Centre for Medical Research (ICMR) collaborating on joint projects such as antimicrobial resistance;
- Central Drugs Standard Control Organization (CDSCO) who have the mandate for drug control of veterinary and human medicines; there is a 'Veterinary Division' under CDSCO responsible for the registration and management of veterinary medicines and biologicals;
- The Indian Pharmacopoeia Commission (IPC) which covers both human and veterinary medicines;
- The Food Safety Standards Authority of India (FSSAI) who lead on food safety issues including the surveillance and control of residues;
- Integrated Disease Surveillance Programme (IDSP) links with the animal health surveillance and expert systems – NADRS and NADRES. IDSP has a 'Veterinary Consultant' to support coordination and collaboration;
- Joint training courses on emerging infectious diseases, joint outbreak investigations, inter-sectoral coordination, bio-terrorism and biosafety/biosecurity have been held. Disease specific training courses have also been conducted including for brucellosis, anthrax, Glanders, rickettsial infections and food borne zoonoses;
- Rapid Response Teams (RRTs) have been jointly developed to respond to disease incidents; the RRTs have a veterinary officer as a team member;
- Some laboratories undertake testing of both human and animal samples e.g. for rabies, anthrax, brucellosis, trypanosomiasis and leptospirosis – joint trainings are provided.

Ministry of Environment, Forest and Climate Change

DADF works with the welfare and animal ethics boards as well as the wildlife division under this ministry:

- Animal Welfare Board of India (AWBI), the statutory advisory body on Animal Welfare Laws which promotes animal welfare in the country. AWBI ensures that animal welfare laws in the country are complied with, provides grants to Animal Welfare Organizations and advises the Government on animal welfare issues;
- In some instances, senior state veterinarians are on the state animal welfare boards and there is generally good cooperation at all levels with the animal welfare organisations involved in animal welfare;
- Committee for the Control and Supervision of Experiments on Animals (CPCSEA) which manages animal ethics boards and approvals across the country;
- The Wildlife Institute of India, Chandrabani, Dehradun, trains government veterinarians from all states in wildlife management and customs officials based at international border posts in CITES related matters including forensics to spot counterfeit wildlife items. There is good communication in the states between AHDs and wildlife departments including on vaccination e.g. FMD and HS in certain zoo species and for zoonoses.

Ministry of Science and Technology (MST)

DADF coordinates with a number of departments of the MST coordinating and integrating areas of mutual interest with developed cross-sectoral linkages with particularly the Department of Science and Technology, the Department of Biotechnology and the Council for Scientific and Industrial Research (CSIR).

Ministry of Law and Justice

DADF coordinates legal and legislative support and the development of new Acts and Rules.

Ministry of Food Processing Industries (MFPI)

DADF works with MFPI on livestock products to enhance farmer incomes by better utilisation and value adding for agricultural produce, encouraging research and development in food and product processing and safety, and the promotion of export of processed food products.

Agricultural and Processed Food Products Export Development Authority (APEDA)

DADF coordinates with APEDA to monitor and control the export of various food commodities including for meat and meat products, poultry and poultry products and dairy products. The registration of facilities for export production/processing is undertaken by APEDA; these are then supervised by the veterinarians of the respective states.

Export Inspection Council (EIC)

DADF and EIC collaborate to support export trade through quality control and inspection; EIC are the official certifying body, with no conflict of interest. DADF and EIC coordinate to register export processing plants, approve certifying veterinarians and carry out assessment of source farms; farms and premises are assessed for compliance under an ongoing programme.

The National Dairy Development Board (NDDB)

DADF works with the NDDB, a statutory body established to promote dairy development, developing various schemes to support and promote the dairy industry. NDDB works with FSSAI and the Government to harmonize domestic food laws with those of Codex.

Department of Agriculture and Research and Education (DARE)

DARE coordinates with DADF to promote agricultural research and education in the country. Under DARE, the Indian Council of Agricultural Research (ICAR) is the premier research organisation for coordinating and managing research and education in agriculture including animal sciences across the entire country; collaborative programmes are implemented between health and agriculture that is between ICAR and ICMR.

Department of Agriculture Cooperation and Farmers Welfare

This Department undertakes various animal health extension activities and administers the RKVY (Rashtriya Krishi Vikas Yojana), a ‘State Plan Scheme’ for additional central assistance launched as a part of the 11th Five Year Plan by the Government of India. RKVY works closely with DADF and the state departments to support animal health policies and programmes.

Veterinary colleges

DADF utilises the expertise and laboratories of the 45 veterinary colleges to provide additional technical support for the design and review of its disease surveillance and control programmes.

State/UT

The level of coordination being undertaken by the states and UT animal health departments with other relevant authorities such as other state departments, Competent Authorities, decentralised agencies and institutions is much more variable.

Some states commented that ‘regular interaction’ was taking place between the VS and the Health Department, however on further questioning this was said to be happening ‘very

irregularly' and infrequently and usually only followed an incident of some kind; there were no formal coordinating committees in place.

IDSP and NADRS surveillance systems are supposed to work together to give a One Health approach to disease detection and emerging infectious diseases. However, there currently is little coordination and information sharing between the two systems for disease outbreaks of mutual interest such as anthrax, rabies and influenza. A number of states are moving to address this problem. For example, in Uttar Pradesh cooperation has been recently improved with the setting up of the 'Standing Committee on Zoonoses' in 2017.

Joint Rapid Response Teams (RRTs) have been set up in all states and most districts. These RRTs are made of medical and para-medical staff with a veterinarian included for zoonoses and any food-borne disease outbreaks. No reports of RRT activities were available to the mission.

NRCE not only carries out surveillance for Japanese Encephalitis and glanders and reports the serological findings to DADF and MoH&FW, but is also the reference laboratory for glanders in humans.

The Chief Disease Investigation Office, Kerala, provides training courses to MoH&FW staff in which One Health topics are discussed, together with state veterinarians. It also carries out diagnostic testing for leptospirosis, brucellosis, rabies and selected parasites on human samples on behalf of MoH&FW. In Kerala there is a scheduled meeting every quarter between the state AHD and MoH&FW.

There is regular sharing of data between the animal health information system, NADRS, and the IDSP portal to generate early warning of high risk periods for zoonoses (e.g. on glanders, Zika virus, leptospirosis, HPAI, etc.). The regular meetings of the zoonosis task force at state level include also other departments such as fisheries, wildlife, disaster management, food and drug safety departments.

Notwithstanding the above progress, collaboration and coordination remains poor between human and animal health. This limitation was observed in most states and is most obvious in the management of food safety and the control of rabies:

- Rabies control is fragmented between the health and animal health services. The health departments have a strong focus on post exposure prophylaxis and working through the Municipal Authorities and some NGOs to carry out dog 'Animal Breeding Control' (ABC) programmes that catch, neuter, vaccinate and release stray dogs. The animal health departments provide limited amounts of rabies vaccine. There is apparently very little communication between the two sectors and no coherent programme for the control of rabies. (See also CC II-7)
- Under the authority of the Food Safety and Standards Act, the states and UTs are responsible for the enforcement of the provisions of the Act, Rules and Regulations. The development of robust effective food safety programmes for animal products is limited by insufficient communication and collaboration between the health and animal health services. City Municipal Authorities have the responsibility of managing the slaughter, distribution and retail of meat and other animal products with little input from the animal health departments. In districts the animal health services take this responsibility though most of the animal slaughter is informal and there is little liaison with the health departments. (See also CCII-8A).
- The State Drug Inspector of the State Health Department is responsible for the licensing of pharmacies and their inspection. Pharmacies appear well run. No reports were available on their inspection or any issues arising at the state animal health departments. (See also CC II-9)

Under the RKVY there are 'State Level Sanctioning Committees', which approve proposals; these committees have representation from the state agricultural departments and administrative services (finance, planning, etc.); the Director of Animal Health sits on these committees.

Strengths:

- Good coordination with multiple stakeholders at national level and in some states
- Regular formal meetings established with many coordinating partners with terms of reference, minutes and formal reports
- A number of joint programmes operating with government stakeholders
- RKVY works coordinates across the state agricultural departments

Weaknesses:

- Limited sharing of zoonotic disease information between human health and animal health authorities
- State departments have little coordination on major programmes for the control of zoonoses such as rabies, brucellosis and anthrax; no national rabies programmes
- Little coordination on food safety at slaughter, distribution and retail

Recommendations:

- Improve the sharing of zoonotic disease information between health and animal health
- Develop state department coordination on major programmes for the control of zoonoses such as rabies, brucellosis and anthrax
- Review establishment of coordinating committees and ensure all priority ones are formally constituted and operating effectively
- Increase coordination on food safety at slaughter, distribution and retail levels

I-7 Physical resources *The access of the VS to relevant physical resources including buildings, transport, telecommunications, cold chain, and other relevant equipment (e.g. computers).*	Levels of advancement
	1. The VS have no or unsuitable physical resources at almost all levels and maintenance of existing infrastructure is poor or non-existent.
	2. The VS have suitable physical resources at national (central) level and at some regional levels, and maintenance and replacement of obsolete items occurs only occasionally.
	3. The VS have suitable physical resources at national, regional and some local levels and maintenance and replacement of obsolete items occurs only occasionally.
	4. The VS have suitable physical resources at all levels and these are regularly maintained.
	5. The VS have suitable physical resources at all levels (national, sub-national and local levels) and these are regularly maintained and updated as more advanced and sophisticated items become available.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): JPW13, SM5, JPW4, JPW6, JPW63

Findings:

India has a very large comprehensive network of veterinary services ranging from small local village clinics with minimal equipment and facilities to world class international reference laboratories. Overall the facilities are suitable at all levels but maintenance is not always up to date and the replacement of old equipment/introduction of new equipment is variable. The major central scheme, Establishment and Strengthening of Veterinary Hospital and Dispensaries (ESHVD) has been initiated to help states set up infrastructure for new veterinary hospitals and dispensaries and to strengthen/equip the existing ones.

National

The DADF office in New Delhi is functional with sufficient space and with good power and internet supplies. Some vehicles are available for staff use but often additional vehicles must be rented. Video conferencing facilities are available on site for connecting through the national network of video conference facilities available at all districts in the country.

There are a very large number of other national facilities including the specialist laboratories such as at Bhopal, Mukteshwar, Hisar and Bareilly, the six Regional Disease Diagnostic Laboratories (CDDLs/RDDL) and the specialist vaccine quality control units at ICAR-IVRI, Izatnagar/Bengaluru and the CCSNIAH, Baghpat. A new FMD research and reference laboratory is currently being commissioned at Bhubaneshwar. Laboratories facilities are covered more fully on CC II-1B.

DADF have worked with the National Informatics Centre to develop NADRS, the National Animal Disease Reporting System. NADRS is operational at block level across the country through a web-based interface and so each block, or node, has been provided with computers and internet access. However, as the internet access is variable a mobile ‘app’ has been developed and is now being piloted – this will allow data entry through smart phones and tablets.

ICAR operate through 101 institutes and 71 agricultural universities spread across the country – one of the largest national agricultural research systems in the world. The ICAR facilities support the DADF programmes and schemes promoting livestock production and improving disease surveillance, including developing improved laboratory diagnostics, and the effective control of animal diseases through improved understanding of the disease pathology and epidemiology and the development of novel vaccines.

State/UT

Very extensive resources are available to the veterinary services at state/UT level. Each state and UT has a headquarters facility with a state laboratory attached or situated close by.

The buildings vary in size with some states having greater resources and more invested in their buildings. The headquarters buildings are mostly adequate in size, well equipped with computers and other office equipment; internet is available with good line speeds. Office furniture and fitting is variable and sometimes in need of replacement.

The state laboratories are covered more fully in CC II-1. In brief summary, the state laboratories buildings and equipment are sufficient for the work that is being undertaken with some having higher levels of functionality with better facilities and equipment. Some state laboratories are rather run down with only limited maintenance. There is also a problem with old equipment being retained due to the difficulty of obtaining clearance for its disposal.

District offices and laboratories are more basic but are also usually adequately equipped for their tasks. Office space is adequate and power, computers and internet are available, although internet access can be very unreliable. Cold chain is available but often with no generator back-up. The district laboratories are suitable for simple bench top tests. Some transport is available but veterinarians and veterinary para-professionals will often provide their own transport sometimes with no reimbursement.

The village clinics, usually about one per 12 villages, are small facilities with usually only two or three rooms. Premises are adequate providing a base for the veterinary para-professionals and for general consultations and dispensing. Drugs, mostly naturopathic products, are stored in drug cupboards. There is usually no fridge or back-up generator. Internet is not available. Transport is sometimes available as 'mobile dispensaries' but not always, in which case the veterinary para-professional will use his/her own vehicle without reimbursement.

States and UTs also provide 'hospital services', that is they provide general clinical services to animals – both livestock and companion animals. The 'Super Speciality Hospitals' are extremely well equipped with specialist diagnostic equipment, good surgical facilities and kennelling/animal holding areas. The rather lesser 'Polyclinics' also generally have X-ray imaging and more basic anaesthetic facilities (usually no gaseous anaesthetics). Large animal 'stocks' are available providing for easy handling of cattle and buffalo.

In addition to the hospitals there are a large number of 'veterinary dispensaries' which are more basic clinics, that undertake clinical examinations, minor surgery and can dispense medicines and administer vaccinations. The veterinary dispensaries have fridges but typically no back-up power supply. Dispensaries are staffed by veterinary para-professionals.

Table 13: Total number of hospitals and clinics nationally

Clinic type	**Number**
Veterinary hospitals/polyclinics	12,235
Veterinary dispensaries	27,149
Veterinary aid centre/mobile dispensaries	25,858

In addition to the above clinical services many states/UTs have 'Mobile Veterinary Clinics', sometimes referred to as ambulances. These ambulances tend to be new, long wheel base vans, well equipped with facilities for first stage assessment and treatment of animals. Some of these ambulances have hydraulic lifts and pulleys to enable large animals to be loaded, others are equipped more specifically for companion animal treatment including for minor surgery.

Strengths:

- Generally good physical infrastructure
- Good access to computers and peripherals – some internet access problems
- Mobile veterinary clinics/ambulances in many states and districts

Weaknesses:

- Mobile phones, vehicles often supplied by staff member with no reimbursement
- Old/broken equipment often retained as not able to 'write it off' the books
- Limited/inadequate funds for maintenance and any upgrades
- There is a need to increase the number of mobile veterinary clinics
- Poor internet access limits the usability of NADRS

Recommendations:

- Reimburse staff for the use of personal mobile phones and vehicles
- Dispose of old/broken equipment
- Develop a repairs, maintenance and upgrade plan and gain budget for its implementation
- Extend the ESVHD programme to strengthen and improve buildings and facilities at laboratories including to support quality assurance programmes
- Provide additional mobile veterinary clinics
- Improve internet access and reliability

I-8 Operational funding *The ability of the VS to access financial resources adequate for their continued operations, independent of political pressure.*	Levels of advancement
	1. Funding for the VS is neither stable nor clearly defined but depends on resources allocated irregularly.
	2. Funding for the VS is clearly defined and regular, but is inadequate for their required base operations (i.e. disease surveillance, early detection and rapid response and veterinary public health).
	3. Funding for the VS is clearly defined and regular, and is adequate for their base operations, but there is no provision for new or expanded operations.
	4. Funding for new or expanded operations is on a case-by-case basis, not always based on risk analysis and/or cost benefit analysis.
	5. Funding for all aspects of VS activities is adequate; all funding is provided under full transparency and allows for full technical independence, based on risk analysis and/or cost benefit analysis.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SM5, JPW5, interviews with all states

Findings:

India's VS are well resourced and well funded through a combination of national (central) and state funding. Funding has been steadily increasing over recent years recognising the policy priority of improving animal health.

National

As agriculture, including animal husbandry, dairying and fisheries is a state responsibility, the emphasis of DADF has been on supplementing efforts of the state governments in the development of these sectors. DADF has provided assistance to the state governments for the control of animal diseases, upgrading of genetic resources, improving feed and fodder supplies, sustainable development of processing and marketing facilities and enhancement of production and profitability of livestock enterprises.

The national government has a well-defined process for funding its activities with the development of formal proposals by the technical/operational ministries and assessment by the Ministry of Finance prior to discussion and approval by parliament. Budget approval occurs very late in the financial year – in India the financial year is April to March and budget approval is only finalised in March; funds for the new financial year are usually released in April/May.

In the last completed financial year (2016/2017) the total budget for livestock health and disease control was 2,540 billion INR; in the previous year (2015/16) actual expenditure was 2,520 billion INR. These central funds covered ASCAD programmes or schemes listed under section II.3B of this report. These national schemes are funded using a 60:40 formula for respectively central to state funds, except for the Himalayan and north east states which are funded 90:10; in the UTs the schemes are 100% funded by central government.

There is considerable year on year budget variation and the percentage that is utilised. These variations are attributed to restricted operations during elections and sometimes delayed release of national budget to the states as proposals were not submitted on time.

Specific budgets for the major disease control schemes are provided in the DADF Annual Report. For the PPR-CP the estimated animal population is 201m and annual budgets for each of the four years 2017/18 to 2020/21 are 1,006 million INR (with 604 million INR to be provided by central government in Year 1), reducing to 332 million INR in Years 2 to 4 (with 204 million INR from central). Similarly, budgets are provided for FMD-CP, brucellosis-CP, CSF-CP and rinderpest monitoring.

General support is also being provided from central to the states for the ASCAD programme supporting particularly the supply of vaccines. In the five year period 2016/17 to 2020/21 the ASCAD budget is to increase approximately 50% from 1,440 million INR to 2,106 million INR.

The NADRS, the animal health information system, is being supported by DADF with an annual commitment of approximately 110 million INR with minor increases due over the next four years.

Other departments and agencies are also supporting animal health programmes such as NDDB.

The RDDLs/CDDL have defined annual budget support which varies by each laboratory. In 2017/18 a total of 40 million INR was allocated to these laboratories.

States/UTs

Livestock health and production is a state obligation and most states provide substantial funding both to support the nationally endorsed programmes (as above) and also to undertake state priorities including activities such as deworming sheep, improving bovine fertility, delivering the livestock insurance scheme and supporting disease investigation and animal treatment. Note that in some states funding for the veterinary services was limited and compromised programme delivery, e.g. some states in the north-east.

All states have a well-defined process for funding with the development of proposals, review by senior staff in the department before assessment by the state finance department and then approval by state government.

To support disease investigations extensive field networks of hospitals, dispensaries, clinics and ambulances are provided by the states/UTs along with supporting laboratory diagnostic testing; the budget covers the operating costs of the buildings, staffing, drugs and materials and some transport. Pressure on operating budgets is reduced by the large number of staff vacancies and some services that are not operational (see also CCI-1A and CCI-1B). Minimal charges are made for clinical examinations (typically 5 INR for a companion animal and 2 INR for livestock) and no charge is made for the drugs on hand – if the required drugs are not available then a prescription is prepared and the owner collects and pays for the drugs at a commercial pharmacy. No charges are made for laboratory testing.

All states are expanding their operations with greater numbers of clinics, ambulances and additional laboratories being developed at the district level. There is no apparent concern over the increased overhead costs that these will result in. The ‘1962’ ambulance and emergency call system is receiving significant support from corporate social responsibility schemes and private philanthropists.

In addition, the RKVY (Rashtriya Krishi Vikas Yojana) a central fund that provides substantial support for state/UT activities and supplements state funding. RKVY is a ‘State Plan Scheme of Additional Central Assistance’ that was launched in 2007 as a part of the 11th Five Year Plan by the Government of India. RKVY focuses on infrastructure development but may also provide funding to support vaccination programmes following application and approval. In 2016/17 RKVY allocated 54 billion INR for animal husbandry, dairying and fisheries sector – this included the purchase of vaccine.

There is insufficient funding for repairs and maintenance at central, state, district and field levels with many facilities requiring attention.

There is little use of risk analysis and/or cost benefit analysis to develop programmes and to manage their implementation effectively and efficiently.

Strengths:

- Sustained and increasing funding
- Well defined budget at central and state levels
- RKVY provides additional support

Weaknesses:

- Limited budget available for repairs and maintenance
- Variable budget and percentage of budget utilised
- Little use of risk analysis and/or cost benefit analysis to develop and implement programmes effectively

Recommendations:

- Develop a costed repairs and maintenance programme and seek budget for its implementation
- Reduce variability of budget by preparing clear documented budget proposals/approvals and defined reporting back; implement regular reviews of rates of expenditure to identify emerging problems
- Use risk analysis and cost benefit/cost effectiveness analysis to develop and implement programmes effectively

I-9 Emergency funding	Levels of advancement
The capability of the VS to access extraordinary financial resources in order to respond to emergency situations or emerging issues; measured by the ease of which contingency and compensatory funding (i.e. arrangements for compensation of producers in emergency situations) can be made available when required.	1. No funding arrangements exist and there is no provision for emergency financial resources.
	2. Funding arrangements with limited resources have been established, but these are inadequate for expected emergency situations (including emerging issues).
	3. Funding arrangements with limited resources have been established; additional resources for emergencies may be approved but approval is through a political process.
	4. Funding arrangements with adequate resources have been established, but in an emergency situation, their operation must be agreed through a non-political process on a case-by-case basis.
	5. Funding arrangements with adequate resources have been established and their rules of operation documented and agreed with interested parties.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5):SM5, JPW9, SGU6

Findings:

Animal health emergency response is funded by central government with supporting funding by states/UTs to further ameliorate the impact of the disease incursion. Emergency funding also covers civil emergencies caused by droughts, cyclones, etc.

DADF have had considerable experience of responding to emergency disease outbreaks most frequently the repeated outbreaks of HPAI that have occurred in recent years. Emergency funding has been timely and efficient.

Contingency planning and emergency funding is covered by the Animal Health Act (2009). Further support is also available under the National Disaster Management Act (2005) which provides the mandate guidelines for the management of all declared disasters.

Central government funds the entire disease response – disease control including culling and disposal, risk mitigation, follow up surveillance and information, education and communication programmes. States estimate the number of RRTs and the resources (PPE, transport, accommodation, etc.) required by RRTs and calculates their costs. In the case of HPAI – funds are provided 'in order to ensure that strategic actions of culling in case of outbreak of Avian Influenza can be taken immediately and expeditiously'.

Compensation is paid at 100% of market value though this value is capped; central government pays 50% of market value for culled animals with a further 50% paid by the state funding. Compensation is only available for HPAI, PRRS and glanders.

The states are able to provide immediate funding from their state departments of Livestock Health and Veterinary Services – their budgets can be utilised in case of any emergencies related to livestock. In states, interim funds have sometimes also been paid by an industry association pending access to central funding. For example, in Telangana following an outbreak of AI, funds were provided by the Poultry Association to cover immediate costs until central funds were released.

Additional funding can be made available at national or state levels following a request to the Ministry of Finance or the state financial departments.

There is no specific funding for emergency preparedness activities such as emergency system development, cross agency coordination mechanisms and running simulation exercises.

Strengths:

- Considerable experience in handling and funding emergency disease outbreaks
- Funding also available for other 'civil disasters' such as droughts and floods
- States are able to immediately fund an emergency response sometimes with private sector support
- Compensation is payable but only for HPAI and glanders

Weaknesses:

- Lack of compensation for diseases other than HPAI and glanders
- No funding for system development, training and simulation exercises

Recommendations:

- Amend legislation so that compensation can be paid for emergency animal diseases, including for the removal of brucellosis and TB positive animals
- Develop an emergency system development plan with identified need for training and exercises for central government and in all states – gain funding to implement the programme

I-10 Capital investment *The capability of the VS to access funding for basic and additional investments (material and non material) that lead to a sustained improvement in the VS operational infrastructure.*	Levels of advancement
	1. There is no capability to establish, maintain or improve the operational infrastructure of the VS.
	2. The VS occasionally develops proposals and secures funding for the establishment, maintenance or improvement of operational infrastructure but this is normally through extraordinary allocations.
	3. The VS regularly secures funding for maintenance and improvements of operational infrastructure, through allocations from the national budget or from other sources, but there are constraints on the use of these allocations.
	4. The VS routinely secures adequate funding for the necessary maintenance and improvement in operational infrastructure.
	5. The VS systematically secures adequate funding for the necessary improvements in operational infrastructure, including with participation from interested parties as required.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): 13JW, P30JW, P40JW, SM5, JPW4

Findings:

The Indian VS have access to considerable funding for the construction and development of new facilities, purchase of vehicles and equipment and training of staff.

Under the National Action Plan (2016/17 to 2020/21) the total number of veterinary 'institutions' (hospitals/polyclinics and veterinary dispensaries is given as 37,401 with a target number nationally of 66,000; it is planned to construct 7,531 each year to 2021 at an estimated cost of more than 50,000 million INR. The National Action Plan is now being implemented.

The scheme, Establishment and Strengthening of Veterinary Hospital and Dispensaries (ESVHD) is supporting state veterinary hospitals and dispensaries and improving existing facilities. The funding pattern is, as for all schemes, 60:40 between centre and states but 90:10 for the eight north-east and three Himalayan states. Also under the National Action Plan (2016/17 to 2020/21) the 'Professional Efficiency Program' aims to provide CE to some 27,000 veterinarians at a cost of more than 60 million INR.

The states, with support from NGOs and the corporate sector, have also been investing heavily in providing mobile veterinary services with ambulances increasingly available in the districts. Some states are also developing district laboratories so that some now have simple laboratories in most of their districts able to carry out base level laboratory testing (blood smears and parasitology and the ability to process and package samples for further testing).

A number of states have introduced call centres to improve service delivery. In Telangana, the innovative '1962' call centre is fully operational. The call centre operators dispatch mobile veterinary clinics to the affected animal – this programme has required increased investment in mobile clinics (all with GPS trackers) to respond to the client calls. Currently there are 100 mobile veterinary clinics operating, one in each designated rural assembly area. This very significant investment has been made to support 'welfare programmes for empowerment of castes involved in conventional and traditional occupations'. The '1962' concept is operating in a number of states already (Gujarat, Madhya Pradesh, Telangana and Andhra Pradesh) with other states due to come on line in the near future.

In some states substantial private sector, philanthropic support and Corporate Social Responsibility (CSR) projects are being provided to purchase additional equipment. For example, in Andhra Pradesh nine fully equipped ambulances have been provided by two family philanthropic funds; the funds purchase and equip the ambulances and the state provides the staff salaries and operational costs. In Chhattisgarh and Odisha mobile veterinary units are

provided by JK Trust[11]; the JK Trust has signed an agreement with the state AHD in Andhra Pradesh to construct and jointly manage 156 Livestock Development Centres. The RKVY also provides funds to AHDs to purchase equipment and vehicles.

To promote the development of state infrastructure the central government has committed to support the development of new veterinary hospitals and dispensaries. The table below shows the amount committed by central government for each new or renovated facility.

Table 14: Cost table of investments in new hospitals and clinics

Category	Hospital (INR)	Dispensary (INR)
New (Building and equipment)	1.75 million (Building – 16 million Equipment – 1.5 million)	1.37 million
Renovation	1 million	0.6 million

Nationally major investment has been made in developing and enhancing new and improved veterinary diagnostic and research laboratories. ICFMD, with BSL-3+ biosafety facilities, is currently being commissioned at a building cost of 2,000 million INR and with an equipment budget of more than 1,500 million INR. The live animal experimental facility estimated to cost 2,400 million INR has not yet been fully financed. Additional investments have also been made in other laboratory facilities including at the state level for states to develop molecular testing capabilities (PCR, LAMP, etc.) and residue testing (HPLC, spectrometers, etc.).

Capital investment is however less than sufficient in some areas with poor maintenance/replacement schedules and an inability to replace old and dysfunctional equipment such as autoclaves and miscellaneous laboratory equipment. There is a lack of availability of transport for field veterinary services in some areas.

Asset registers are maintained but without any expected replacement dates.

To support the 2018 livestock census some 7,500 ‘tablet’ computers have been provided to the census enumerators to allow for direct data entry; these have been paid for by DADF.

Rashtriya Krishi Vikas Yojana (RKVY) is a ‘State Plan Scheme of Additional Central Assistance’ that was launched in 2007 as a part of the 11th Five Year Plan by the Government of India. The RKVY programme focuses on agricultural development and sustainability and, in the current phase, is being implemented over three years until 2019-20 with a budget allocation of 157 billion INR. RKVY focuses on infrastructure development but also can provide funding to support vaccination programmes following application and approval. In 2016/17 RKVY allocated 54 billion INR for animal husbandry, dairying and fisheries sector – this included the building of veterinary dispensaries and clinics and the purchase of ambulances.

Strengths:

- Ongoing capital investment in buildings, transport particularly animal ambulances and equipment
- RKVY, agricultural development fund, supports the development of veterinary services infrastructure
- Major investment in new facilities such as ICFMD

Weaknesses:

- Insufficient transport provided in some districts and local areas
- Some equipment is old and needs replacing

[11] The J.K.Trust Gram Vikas Yojana is a programme intended to improve the quality of life in the rural areas. http://www.jktrust.org

Recommendations:

- Provide adequate transport to districts and local areas
- Review and document the age and replacement date of all equipment

I-11. Management of resources and operations *The capability of the VS to document and manage their resources and operations in order to analyse, plan and improve both efficiency and effectiveness.*	Levels of advancement
	1. The VS do not have adequate records or documented procedures to allow appropriate management of resources and operations
	2. The VS have adequate records and/or documented procedures but do not use these for management, analysis, control or planning.
	3. The VS have adequate records, documentation and management systems and use these to a limited extent for the control of efficiency and effectiveness
	4. The VS regularly analyse records and documented procedures to improve efficiency and effectiveness
	5. The VS have fully effective management systems, which are regularly audited and permit a proactive continuous improvement of efficiency and effectiveness.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SM5, JPW12, JPW3, JPW58, SH3, SH4, SGU5, SGU6, JPW97, JPW88

Findings:

India has extensive administrative and reporting documentation for many aspects of the VS. Overall the country is only making limited use of its activity records, programme reports and financial statements to assess and revise its programmes to ensure their effectiveness and efficiency.

Reports are prepared monthly at local and district levels and submitted to their managing divisions and states. These reports cover all VS activities including clinical services, drug and vaccine use, and the implementation of disease control programmes for both state and national schemes. States report nationally in real time on urgent changes and developments and periodically, generally monthly, on the progress being made in delivering schemes.

All states have good maps and knowledge of their livestock industries. Livestock numbers and distribution are assessed by a national census every five years. The most recent census was conducted in 2012; the census due in 2017 has been delayed until 2018 as the Government wanted all enumerators to have ‘tablet’ computers to allow for direct data entry. The census is due to take place in mid-2018 and will provide the basis for planning and resourcing of the VS over the next five years.

Yearly plans/diaries are prepared for each state VS to identify which activities will be taking place at set times during the year and to allow for the necessary preparations; for example, prior to a round of FMD vaccination (twice per year) advisory notes are sent out by DADF to the states and then on by the states to their districts with advice being provided to each locality when the vaccination round will actually take place in their area – thus allowing owners to bring their animals into central locations or to hold them until they have been vaccinated.

NADRS is intended to provide baseline data on the detection of notifiable disease and allow the efficient use of resources. However, currently NADRS is experiencing problems with its functionality as many blocks, and also some districts and states, do not have adequate power supply and internet links. NADRS is focused on ‘list’ diseases only, which further limits its value as this results in the loss of potentially valuable baseline data on endemic diseases and syndromes, and therefore a loss of sensitivity for the early detection of unknown emerging diseases.

For key disease control programmes, such as FMD-CP and PPR-CP, vaccination data is uploaded in real time using mobile apps – thus allowing close monitoring of vaccine coverage. Post-vaccination monitoring takes place to assess the coverage and immune response; follow-up vaccination is provided if the coverage rate/response is considered to be too low. There is some checking of FMD vaccination records being undertaken in some states by veterinarians and veterinary para-professionals. There are sometimes unrealistic and illogical numbers

being reported on target populations, the number of vaccinations delivered and the purported vaccination coverage.

The functioning of the brucellosis control programme in 'milch' animals (cattle and buffaloes) is based on vaccination and communication on risk reduction, such as the removal of aborted materials; it is not permitted to cull infected animals. Animal identification is being encouraged but is only rarely being implemented. This results in a control programme that is limited in its ability to effectively and efficiently control the disease.

In a number of states 'tribal areas' exist which are less engaged with government systems and tend to have fewer resources such as veterinary hospitals and clinics. States recognise this limitation and are making efforts to ensure that vaccine coverage in these areas is high; with less contact with the VS there is a risk that these areas will have a less sensitive surveillance system for the early detection and response to outbreaks. Active surveillance programmes are undertaken to provide an indication of the animal health status of these areas. In some states the limitations of providing animal services to the tribal areas is being addressed by contracting out veterinary services.

Detailed annual budgets are prepared at state and national levels that consider the number and type of facilities to be built, renovated, maintained and operated and the number and type of services to be provided including clinical services, the supply of medicines, vaccination and carrying out state and national disease surveillance and control programmes. Budgets and available funds are monitored and adjusted as the year progresses.

The CDSCO, which manages drug registration including import, manufacture and distribution, reports on the status of 'marketing authorisation proposals' for all products including for veterinary medicines and biologicals. It was noted that sometimes authorisation proposals have been delayed e.g. one application for the import of vaccines had been pending for more than four months.

There are significant concerns over the availability of manpower, both veterinarians and veterinary para-professionals, with significant number of vacancies being reported in many states. This shortage is apparently due to administrative delays in recruiting staff to already sanctioned positions. The high vacancy rate compromises the ability to deliver an effective VS. (See CCI-1A&B)

Similarly, at DADF vacancies have persisted for some time for many of the senior technical positions such as for the Joint Commissioner and Assistant Commissioners. The delay in filling these positions is attributed to administrative delays.

Considerable innovation is supporting effective delivery of the VS. For example, in Chhattisgarh the 'CGDISSA' (Chhattisgarh Diseases Investigation Information System for Animals) is using a mobile app to deliver laboratory results rapidly to the clinician and/or direct to the owner.

One concern identified by the mission was the lack of designated specialist positions and the promotion/relocation of staff often being based on age rather than on competencies. This approach results in staff with specialist skills not being used effectively or efficiently.

Notwithstanding the above comments, many activities are not documented/not well documented. For example, the costs (capital, fixed and operating) are not well documented and are not being assessed for the delivery of veterinary services to companion animals – this limits the ability to undertake a cost-benefit analysis and to adjust policies accordingly. Another example is that some states are working with their Forestry Departments to undertake ring vaccination of domestic livestock against FMD, BQ, and HS, but this activity is largely undocumented.

There is a general lack of risk analysis to identify system weaknesses and high risk activities and so to allow for efficient risk mitigation through re-alignment of resources and activities.

Strengths:

- Extensive reports are developed
- Key programme activities are recorded
- RKVY has an effective reporting and monitoring and evaluation programme of its activities

Weaknesses:

- No systematic periodic assessment and review of programmes and activities
- No cost-benefit analyses undertaken
- Little auditing of programmes and activities
- High number of vacancies, veterinarians and veterinary para-professionals, including at senior management levels

Recommendations:

- Comprehensively address the problem of the high number of veterinarian and veterinary para-professional vacancies, including at senior management levels
- Implement the systematic periodic assessment and review of programmes
- Develop skills in cost-benefit and other economic analyses and develop economic assessments of programmes
- Conduct periodic auditing of programmes and activities

III.2 Fundamental component II: Technical authority and capability

This component of the evaluation concerns the authority and capability of the VS to develop and apply sanitary measures and science-based procedures supporting those measures. It comprises eighteen critical competencies.

For all sections of this chapter, the critical competency includes collaboration with relevant authorities, including other ministries and Competent Authorities, national agencies and decentralised institutions that share authority or have mutual interest in relevant areas.

Critical competencies:

Section II-1	**Veterinary laboratory diagnosis**
	A. Access to veterinary laboratory diagnosis
	B. Suitability of national laboratory infrastructures
Section II-2	**Laboratory quality assurance**
Section II-3	**Risk analysis**
Section II-4	**Quarantine and border security**
Section II-5	**Epidemiological surveillance and early detection**
	A. Passive Epidemiological surveillance
	B. Active Epidemiological surveillance
Section II-6	**Emergency response**
Section II-7	**Disease prevention, control and eradication**
Section II-8	**Food safety**
	A. Regulation, authorisation and inspection of establishments for production, processing and distribution of food of animal origin
	B. Ante and post mortem inspection at abattoirs and associated premises
	C. Inspection of collection, processing and distribution of products of animal origin
Section II-9	**Veterinary medicines and biologicals**
Section II-10	**Residue testing**
Section II-11	**Animal feed safety**
Section II-12	**Identification and traceability**
	A. Animal identification and movement control
	B. Identification and traceability of products of animal origin
Section II-13	**Animal welfare**

Terrestrial Code References:

Chapter 1.4. on Animal health surveillance.

Chapter 1.5. on Surveillance for arthropod vectors of animal diseases.

Chapter 2.1. on Import risk analysis.
Points 6, 7 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General Organisation / Procedures and standards.
Point 1 of Article 3.2.4. on Evaluation criteria for quality systems.
Point 3 of Article 3.2.6. on Evaluation criteria for material resources: Technical.
Points 1 and 2 of Article 3.2.7. on Legislation and functional capabilities: Animal health, animal welfare and veterinary public health / Export/import inspection.
Points 1-3 of Article 3.2.8. on Animal health controls: Animal health status / Animal health control / National animal disease reporting systems.
Points 1-5 of Article 3.2.9. on Veterinary public health controls: Food hygiene / Zoonoses / Chemical residue testing programmes / Veterinary medicines/ Integration between animal health controls and veterinary public health.
Sub-point f) of Point 4 of Article 3.2.10. on Veterinary Services administration: Formal linkages with sources of independent scientific expertise.
Points 2 and 5-7 of Article 3.2.14. on National information on human resources / Laboratory services / Veterinary legislation, regulations and functional capabilities / Animal health and veterinary public health controls.
Article 3.4.12. on Human food production chain.

Chapter 4.1. on General principles on identification and traceability of live animals.
Chapter 4.2. on Design and implementation of identification systems to achieve animal traceability.
Chapter 4.12. on Disposal of dead animal.

Chapter 6.2. on Control of biological hazards of animal health and public health importance through ante- and post-mortem meat inspection.
Chapter 6.3. on Control of hazards of animal health and public health importance in animal feed.

Chapters 6.6. to 6.10. on Antimicrobial resistance.
Chapter 7.1. Introduction to the recommendations for animal welfare.
Chapter 7.2. Transport of animals by sea.
Chapter 7.3. Transport of animals by land.
Chapter 7.4. Transport of animals by air.
Chapter 7.5. Slaughter of animals.
Chapter 7.6. Killing of animals for disease control purposes.

II-1 Veterinary laboratory diagnosis **A Access to veterinary laboratory diagnosis** *The authority and capability of the VS to have access to laboratory diagnosis in order to identify and record pathogenic agents, including those relevant for public health, that can adversely affect animals and animal products.*	Levels of advancement
	1. Disease diagnosis is almost always conducted by clinical means only, with no access to and use of a laboratory to obtain a correct diagnosis.
	2. For major zoonoses and diseases of national economic importance, the VS have access to and use a laboratory to obtain a correct diagnosis.
	3. For other zoonoses and diseases present in the country, the VS have access to and use a laboratory to obtain a correct diagnosis.
	4. For diseases of zoonotic or economic importance not present in the country, but known to exist in the region and/ or that could enter the country, the VS have access to and use a laboratory to obtain a correct diagnosis.
	5. In the case of new and emerging diseases in the region or world, the VS have access to and use a network of national or international reference laboratories (e.g. an OIE Reference Laboratory) to obtain a correct diagnosis.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): HLB6, SKA1, SH5, SP6, JPW9, JPW16, JPW38, JPW39, JPW44, JPW51, JPW71, JPW72, JW19, SH1, SH2, P4JW, P27JW, P71JW,

Findings:

India has a very extensive nationwide network of veterinary laboratories which provides access to a hierarchy of diagnostic testing capabilities from basic to international best practice using 'gold standard' diagnostics. In addition to the veterinary diagnostic laboratories run by DADF and the states, ICAR has a number of specialist laboratories which undertake research and also conduct high level diagnostic testing. The laboratories are all well used with a good throughput of cases.

District/regional laboratories

The base level laboratories are generally the district disease diagnostic laboratories (DDLs) which conduct blood smears for protozoal parasites and faecal analysis for endoparasites; some district laboratories can also conduct simple biochemistry and bacteriology with antibiotic sensitivity testing. When necessary the district laboratories undertake transfer/packing of diagnostic samples for shipment on to other laboratories, most commonly the state disease diagnostic laboratories (SDDLs) but sometimes directly to the higher level regional and specialist laboratories. Note also that some local pharmacies and block offices can do very basic laboratory testing (blood smears and faecal analysis).

The states vary in the number of districts which have laboratories – in some states all or nearly all districts have laboratories, in other states one district/regional laboratory may cover a number of districts. For example, Uttar Pradesh has one laboratory per region (or division) that is one laboratory covers four districts with no district laboratories. In Maharashtra there are eight regional laboratories that support the 28 district diagnostic laboratories. Similarly, in Rajasthan there are six regional laboratories and 28 DDLs.

Note also that in most states some veterinary hospitals/dispensaries have basic diagnostic equipment and can perform tests such as faecal examinations, urine analysis, mastitis, and rapid diagnostic tests for mastitis, brucellosis, etc.

State laboratories

Each state has a SDDL, the state level laboratory. The capabilities and competencies of the SDDLs vary but generally a wide array of tests is provided including those for virology, bacteriology, parasitology, mycology, haematology, pathology/histopathology, toxicology and biochemistry; molecular diagnostic tests are available often with real time or conventional PCR though in some states this capability is still under development. A number of SDDLs also have associated feed testing laboratories (toxicology and feed analysis).

The main work of the SDDLs is the investigation and diagnosis of disease conditions in the state's livestock, canines, pigs, poultry and wildlife. SDDL staff often attend disease outbreaks, collecting samples for laboratory diagnosis, they also train and support field staff in understanding and implementing the principles of diseases containment; they are responsible for the sero-monitoring of vaccination programmes.

All states provide a network of diagnostic laboratories but the number and accessibility varies. Overall the policy in all states is to increase access in all areas to diagnostic services and most states have a significant investment plan to build new laboratories and to enhance existing ones. Some states are developing novel approaches to improving their services such as the electronic delivery of laboratory results as in the 'Chhattisgarh Disease Investigation Information System for Animals (CGDISSA).

Regional laboratories

There are five Regional Disease Diagnostic Laboratories (RDDLs) and the Central Disease Diagnostic Laboratory (CDDL), also referred to as the 'Centre for Animal Disease Research and Diagnosis' (CADRAD). CADRAD has the mandate for disease diagnosis and the development and standardisation of diagnostic methods, kits and reagents. CADRAD's role in standardisation is expected to change with the establishment of the CCSNIAH institute in Baghpat, under DADF (see CCII.9). CADRAD is recognised as the CDDL by DADF, though it is operated by ICAR-IVRI.

In addition to laboratory diagnosis, test research and development, CADRAD also provides week long training modules for laboratory staff covering disease surveillance and epidemiology, emergency disease reporting and risk analysis of animal diseases, collection and dispatch of diagnostic specimens, improvement of laboratory diagnostic capabilities, laboratory biosecurity, bacterial, fungal, parasitic and viral disease diagnosis, pathology/histopathology and toxicology.

The five RDDLs (west, east, south, north and northeast) are:

- Disease Investigation Laboratory, Pune (Western RDDL)
- Instiute of Animal Health and Veterinary Biologicals, Kolkata (Eastern RDDL)
- Instiute of Animal Health and Veterinary Biologicals, Bengaluru (Southern RDDL)
- Animal Health Institute, Jallandhar, (Northern RDDL)
- Institute of Veterinary Biologicals, Guwahati (North eastern RDDL)

RDDLs are the regional laboratories under DADF management that serve as 'regional referral laboratories' for the economically important livestock diseases by providing diagnostic services, both primary and confirmatory to the states of their region. The laboratories establishment and operational costs are funded by DADF; salaries are paid either entirely by the state or are funded in part by DADF.

The RDDLs are responsible for disease diagnosis and the collection of viral, bacterial and parasitic agents and providing these to the 'national reference laboratories'. RDDLs are also required to provide information on the epidemiology of the economically important diseases in their region. They are also responsible for training regional SDDL staff in disease diagnosis.

Visits to and annual reports from the CDDL and RDDLs indicate a good level and range of diagnostic samples are being handled. For example, CDDL reported for the year 2016/17 that it had handled over 28,000 samples which were made up of 4,700 bacteriology, 21,600 virology (8,000 serology, 13,000 tissue samples), 400 pathology, 1,700 parasitology and 150 toxicology. Directly comparable figures were not available for the RDDLs but all were conducting a similar ratio of tests but with a significantly lower throughput.

Specialist laboratories

National Research Centre on Equines (NRCE), Hisar[12]

This is the national reference laboratory for equine diseases.

NRCE, with support from its sub-campus in Bikaner, carries out research into equine health and reproduction including developing new diagnostic tests and conducting surveillance for glanders, EIA, EI, surra and piroplasmosis. It covers all species of equidae including horses, donkeys and mules. NRCE was instrumental in demonstrating that India was free of African Horse Sickness (AHS) – recognised as free by OIE in 2006; it has supported the surveillance and control of a number of glanders outbreaks (see also CCII-7)

In addition to NRCE, two other laboratories are recognised by central DADF for glanders testing: Royal Western India Turf Club (Pune) and the CMVL (Meerut). The Pune laboratory has the mandate to provide training to veterinarians on glanders. The NRCE has implemented an OIE Twinning project on glanders with the OIE Reference Centre for glanders, FLI Germany. The Pune laboratory is also the reference laboratory for glanders in humans. Due to the high demand for tests, the NRCE has made available their ELISA kit to several state diagnostic laboratories (e.g. Sonipat Laboratory in Haryana; Veterinary Polyclinic in Jodhpur, Rajasthan) to speed up disease investigation and surveillance.

National Institute of High Security Animal Diseases (NIHSAD), Bhopal[13]

NIHSAD is an institute of ICAR established to conduct research into exotic and emerging pathogens of animals. NIHSAD is the national reference laboratory for avian influenza and other exotic diseases.

NIHSAD was established as an independent institute in 2014 from its original status as the HSADL, a facility of the Indian Veterinary Research Institute (IVRI), Izatnagar. The bio-containment laboratory of HSADL (operating since 1998) handles exotic/emerging animal diseases, provides rapid diagnosis and conducts basic and applied research on emerging animal pathogens. The institute has a BSL-3+ biocontainment laboratory and animal facility.

NIHSAD/HSADL has led the development and standardisation of tests for the diagnosis and identification of the subtype of the avian influenza virus.

The laboratory is an OIE Reference Laboratory for HPAI and LPAI (since 2009) and is part of the FAO/OIE OFFLU network, also supporting some neighbouring countries with their AI diagnostics. It has a state-of-the-art facility with a strong diagnostic and research programme and reputation, particularly for AI.

Most major exotic and emerging disease threats are covered by diagnostic and research programmes at NIHSAD including swine influenza, novel coronaviruses, West Nile Virus, Nipah, BVD strains, Border Disease virus, Schmallenburg virus and CCHF, amongst others. A PRRS programme was fully developed but other major porcine diseases, assumed to be exotic and potentially a threat to India, such as porcine epidemic diarrhea or porcine myocarditis (PMWS) were not yet being considered in terms of developing diagnostic capacity.

International Centre for Foot & Mouth Disease (ICFMD), Bhubaneswar

ICFMD is a new research and development facility which has been purpose built for ICAR with a BSL-3+ laboratory and will have a facility for animal experimentation. The objective of this new laboratory facility is to conduct biomedical research into FMD; it is also intended to serve as a regional resource Laboratory for SAARC countries. At the time of the mission the laboratory facility was just being commissioned and the animal experimentation facility was still under construction. The facility is very impressive with good design for biocontainment and

[12] http://nrce.gov.in/facilities.php
[13] http://www.nihsad.nic.in

biosafety. It was estimated that the total cost of the facility plus equipment will be in excess of 400 million USD.

ICAR-Mukteshwar

The Mukteshwar laboratory is the National Reference Laboratory for FMD; it heads a network of 23 FMD-designated laboratories located across the country. The institute is a member of the Global FAO/OIE Network of FMD Reference Laboratories and functions as the FAO Reference Centre for FMD in South Asia; it is the SAARC lead diagnostic laboratory for FMD. Although this laboratory has BSL-3 facilities, biosecurity measures for handling of potentially FMD infected material were very limited; the laboratory largely relies on its isolated location.

Other laboratories

Veterinary universities and colleges

The veterinary universities and colleges have variable capabilities in research and diagnostic testing. They work with the local veterinary services to support their diagnostic needs particularly in some states such as in Tamil Nadu (Tamil Nadu Veterinary and Animal Sciences University – TANUVAS), Assam (College of Veterinary Science), College of Veterinary Science and Animal Husbandry, Mizoram. In Karnataka, the Karnataka Veterinary, Animal and Fisheries Sciences University (KVAFSU) operates a rabies diagnostic laboratory with a 'state-of-the-art laboratory setup' which serves as the national rabies reference laboratory.

Central Military Veterinary Laboratory

The Central Military Veterinary Laboratory (CMVL) is responsible for the health and welfare of the animals working for the Indian Armed Forces. It conducts research on diseases, their diagnosis, investigation and epidemiology. The facility is equipped to carry out tests for biochemistry, nutrition, haematology, parasitology, pathology, serology, virology, molecular biology and bacteriology.

AQCS

The AQCS quarantine stations only collect and dispatch samples – they have no laboratories. Samples are sent on to specialist laboratories such as NIHSAD, NRCE, CDDL, RDDLs and some veterinary colleges

Sample collection and management

Diagnostic samples are collected and packaged usually by local veterinary service staff and then dispatched by 'messenger' to the laboratory, that is, the sample is driven directly to the laboratory by a person. It is said that the samples are well packed and appropriately chilled and that the samples are rarely unsuitable for testing but no reports were available.

Samples are referred through the state, regional and national laboratory system to the laboratories with the necessary levels of capability and capacity. Sample flow diagrams are available to expedite this process for the surveillance programme for avian influenza and some other diseases.

Laboratories generally do not have Laboratory Information Management Systems (LIMS) and so mostly operate on hard copy records which makes data recording, quality control and analysis more difficult. Some states are developing LIMS for their laboratory results as in the 'Chhattisgarh Disease Investigation Information System for Animals' (CGDISSA).

Laboratory development

OIE twinning programmes were implemented at NRCE, Hisar (equine influenza, piroplasmosis and glanders) and at KVAFSU, Bengaluru for rabies.

India does not routinely use the network of international reference laboratories (e.g. an OIE reference laboratory) to validate a correct diagnosis or to participate in international proficiency tests.

Private laboratories

There are a number of private laboratories providing service to private veterinarians primarily focusing on companion animals. The laboratories are regarded as competent with good facilities and provide a wide range of diagnostic tests.

The FSSAI is mandated to approve laboratories for food safety testing. One such approved private laboratory, 'Vimta' undertook a six-monthly check for pest and other chemical residues in milk at the Goomati Cooperative Milk Producers Union, processing facility in Agartala.

Strengths:

- Extensive national network of laboratories with increasing diagnostic capabilities
- Recognised international reference laboratories for AI and FMD
- Good throughput of diagnostic samples

Weaknesses:

- Limited electronic LIMS in use which limits data handling, quality control and reporting
- Some states have no/few district level laboratories with resulting limited access

Recommendations:

- Progressively implement a national LIMS standard throughout the country
- Review state laboratory networks and access to laboratory diagnostic tests and revise/update as necessary

II-1 Veterinary laboratory diagnosis **B. Suitability of national laboratory infrastructures** *The sustainability, effectiveness and efficiency of the national (public and private) laboratory infrastructures to service the needs of the VS*	Levels of advancement
	1. The national laboratory infrastructure does not meet the need of the VS.
	2. The national laboratory infrastructure meets partially the needs of the VS, but is not entirely sustainable, as organisational deficiencies with regard to the effective and efficient management of resources and infrastructure (including maintenance) are apparent
	3. The national laboratory infrastructure generally meets the needs of the VS. Resources and organisation appear to be managed effectively and efficiently, but their regular funding is inadequate to support a sustainable and regularly maintained infrastructure
	4. The national laboratory infrastructure generally meets the needs of the VS and is subject to timely maintenance programmes but needs new investments in certain aspects (e.g. accessibility to laboratories, number or type of analyses).
	5. The national laboratory infrastructure meets the needs of the VS, and is sustainable and regularly audited.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SKA8, SKA1, SKA24, SKA25, SKA26, SH5, SP6, JPW4, JPW10, JPW15, JPW38, JPW39, JPW51, SK4, SK5, SG19, JW71, JW72, P27JW.

Findings:

India has a hierarchy of laboratories with a range of capabilities (see also CCII-1A). This range of laboratories is mirrored in the laboratory facilities and infrastructure that are available.

At the lowest level, some veterinary hospitals/dispensaries, have limited facilities for simple benchtop laboratory tests such as for simple haematology (blood smears only) and parasitology (faecal examinations).

District laboratories commonly have a single room for simple benchtop tests. These rooms are part of the district office complex and have no specific facilities. Simple benchtops are available with power and water. Very few biosafety facilities are available – some laboratories have aged and untested BSL-2 cabinets. The facilities are adequate for the tests undertaken. There is minimal maintenance undertaken and the facilities can be quite run down. Older and no longer functional equipment is sometimes retained as it is problematic to write off such equipment.

Some states also have divisional laboratories with more advanced equipment and facilities than most district laboratories. Such laboratories have a number of rooms set aside for laboratory tests but few other additional facilities.

State Disease Diagnostic Laboratories (SDDLs) vary considerably. They are generally situated in a purpose built standalone building, but sometimes in multiple buildings and sometimes co-located in the same building as the state animal health office. The laboratories have multiple rooms assigned to the different test disciplines. The buildings are often old and run down with few signs of recent maintenance; old equipment that is dysfunctional or no longer in use is often retained leading to a limitation of available space. BSL-2 cabinets are commonly available but little other biosafety/biocontainment equipment. Variability includes some SDDLs having approved ‘Annual Maintenance Contracts’ for the repair and calibration of facilities and equipment, others have PCR rooms and equipment and some already have or having built specialist laboratory facilities.

The CDDL and RDDLs are the regional reference laboratories, established and operated by the states, vary in facilities and capacity. The northern RDDL, southern RDDL, eastern RDDL and central DDL have prefabricated BSL-3 facilities whereas the northeastern RRDL has a mobile BSL-3 facility. Rooms are set up for the different test types such as clinical pathology, gross and histopathology, haematology, serology, bacteriology, virology, parasitology,

toxicology and molecular tests. These laboratories are maintained at a higher standard than the SDDLs. Note that in states with RDDLs these operate as the SDDL for that state.

The specialist laboratories of ICAR are large extensive facilities usually with operational BSL-3 for their laboratories and animal testing e.g. NIHSAD, NRCE. Mukteshwar has one BSL-3 laboratory for handling suspect infected samples for virus detection and suitable infrastructures, albeit rather old and limited in space, and has equipment for undertaking routine serology for viral sub-typing and differentiation between previously clinically infected and vaccinated animals. These facilities have large operational budgets that provide for ongoing maintenance and so are well maintained with good levels of biosafety and biosecurity. NIHSAD, Bhopal, has an advanced proposal to build a BSL-4 facility and this is expected to be approved and built in the next few years. ICFMD, a new FMD surveillance laboratory, was being commissioned during the mission at Bhubaneswar. This laboratory was built and equipped at a cost of over 300m USD; the animal house is not yet completed and is estimated to cost another 50m USD. This facility has state of the art biosecurity including at BSL-4, with full air-handling through hepa filters and waste and waste water management with autoclaving and incineration or chemical treatment. ICFMD is intended to become the regional reference laboratory for FMD.

CCSNIAH at Baghpat is a purpose built facility to test and validate vaccines and biologicals. The facility is large with extensive laboratories and animal testing rooms. BSL-2 biosafety is operating but the BSL-3 facility is currently not. The institute is in need of some ongoing maintenance and this is recognised by the Director and his staff.

Veterinary college laboratories vary in facilities with some working with ICAR or are part of the ICAR system (the ICAR ‘deemed universities’; that is ICAR research centres providing tertiary education) and have international best practice standards; others are less well resourced and provide only basic teaching needs.

Strengths:

- Extensive network of laboratory facilities at district, state, regional and national levels
- Referral of samples up through the laboratory network to higher laboratories where more sophisticated tests are available

Weaknesses:

- Most district and some state laboratories are in need of ongoing maintenance
- Limited biosecurity/biosafety facilities in most laboratories

Recommendations:

- Develop a budget for ongoing maintenance and upgrading of the laboratory facilities; gain approval and provide regular ongoing maintenance programmes
- Undertake laboratory audits to assess the limitations of their biosecurity/biosafety; develop a needs assessment and budget for improving biosecurity/biosafety; implement the necessary upgrades

II-2 Laboratory quality assurance *The quality of laboratories (that conduct diagnostic testing or analysis for chemical residues, antimicrobial residues, toxins, or tests for, biological efficacy, etc.) as measured by the use of formal QA systems including, but not limited to, participation in relevant proficiency testing programmes.*	Levels of advancement
	1. No laboratories used by the public sector VS are using formal QA systems.
	2. Some laboratories used by the public sector VS are using formal QA systems.
	3. All laboratories used by the public sector VS are using formal QA systems.
	4. All the laboratories used by the public sector VS and most or all private laboratories are using formal QA systems.
	5. All the laboratories used by the public sector VS and most or all private laboratories are using formal QA programmes that meet OIE, ISO 17025, or equivalent QA standard guidelines.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): JPW19, JPW20, SH5, SK1, JW4, P9JW, P22JW, P34JW, P35JW, P36JW.

Findings:

Few veterinary laboratories have formal or informal laboratory quality assurance programmes in India.

The Central Military Veterinary Laboratory (CMVL) is currently the only veterinary diagnostic laboratory accredited to ISO17025. The laboratory is accredited for a wide range of diagnostic tests. The research and development laboratory facility at the Translational Research Platform for Veterinary Biologicals (TANUVAS), is also ISO accredited. It is also understood that there are also a number of accredited EIC laboratories.

Two laboratories, NIHSAD, Bhopal, and the Research and Development Laboratory, Hyderabad, have well developed plans to implement the ISO17025 quality management system for providing rapid and accurate diagnostic services for the detection of avian influenza and sexually transmitted diseases in bovines respectively. NIHSAD as an OIE reference laboratory has been given a two year deadline within which it must achieve ISO17025 accreditation or it will lose its OIE reference laboratory status.

The CDDL and RDDLs have no accreditation programme. SRDDL, Bengaluru, has applied for National Accreditation Board for Testing and Calibration Laboratories (NABL) accreditation; other laboratories are said to be considering accreditation.

CCSNIAH, Baghpat, undertake the quality control and assurance of veterinary biologicals and also act as the nodal institute to recommend licensing of veterinary vaccines. Formal approval for the declaration of the CCSNIAH as Central Drug Laboratory is currently under consideration by CDSCO in the Ministry of Health and family Welfare. It was stated that CCSNIAH will be ISO17025 accredited by the end of 2018.

State laboratories generally have no formal quality assurance programme but good laboratory practices are usually in place with the use of SOPs, positive/negative controls and good recording of samples and results. Calibration and essential maintenance of equipment such as replacement / maintenance of laminar flow filters is not being routinely undertaken and recorded in most laboratories.

It is understood that the private laboratories of some production companies have formal quality assurance systems.

A number of quality assurance problems were detected including:

- Only very limited proficiency testing is being undertaken by IVRI-Bareilly for a few other laboratories for some diseases;
- Some laboratories are not storing vaccine correctly with bottles being frozen. In some laboratories there was no system for temperature monitoring or alerts;

- Many laboratories have old equipment that is not being maintained or calibrated; such equipment included biosafety cabinets, autoclaves and incubators.

There is a wide recognition of the need to progressively extend the quality assurance programmes to other laboratories.

Strengths:

- Awareness of the need to introduce quality assurance
- Central Military Veterinary Laboratory has been accredited ISO17025
- Some laboratories actively progressing formal accreditation

Weaknesses:

- Few laboratories accredited
- Immediate laboratory quality assurance problems apparent such as the lack of temperature control over biologicals

Recommendations:

- Implement a policy requiring laboratories to be formally quality assurance accredited
- Address immediate laboratory quality assurance problems such as the lack of temperature control over biologicals, lack of maintenance and calibration of equipment and the insufficient attention paid to biosafety and biosecurity

II-3 Risk analysis *The authority and capability of the VS to base its risk management measures on risk assessment.*	Levels of advancement
	1. Risk management measures are not usually supported by risk assessment.
	2. The VS compile and maintain data but do not have the capability to carry out risk analysis. Some risk management measures are based on risk assessment.
	3. The VS compile and maintain data and have the capability to carry out risk analysis. The majority of risk management measures are based on risk assessment.
	4. The VS conduct risk analysis in compliance with relevant OIE standards, and base their risk management measures on the outcomes of risk assessment.
	5. The VS are consistent in basing sanitary measures on risk assessment, and in communicating their procedures and outcomes internationally, meeting all their OIE obligations (including WTO SPS Agreement obligations where applicable).

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SKA11, JW53, JW56, JW57

Findings:

There is no established risk analysis unit and limited skills in epidemiology, economics and the assessment of value chains.

Risk analysis is carried out for the import of animal and animal products by a 'Risk Analysis Committee' under the DADF chaired by the Joint Secretary for Trade with the other Joint Secretaries as members – note that the Joint Secretaries are India Administrative Service (IAS) and are not technical staff. This committee considers the applications for import permits for various livestock products, after a risk analysis has been conducted by technical experts of DADF on the basis of scientific evidence and considering OIE guidelines. The risk analysis undertaken is qualitative and based on product and place of origin only.

AQCS undertake the risk management of imported animals and animal products through their quarantine stations and by holding, testing animals and products as required.

For disease epidemiology and forecasting, ICAR-NIVEDI has developed NADRES (National Animal Disease Referral Expert System). It is a national risk-based approach to identifying and forecasting possible disease outbreaks likely to occur within a two-month period in all districts in India. The predictive model uses parameters such as climate, altitude, location and history of disease; the models are simplistic but regarded as having value. NIVEDI currently does not have any epidemiologists.

As an example of NADRES output, in Karnataka monthly and annual disease outbreak and vaccination data is analysed to formulate more effective control measures and identify endemic and village clusters for a particular disease and so to promote vaccination. Information is provided to field staff including a list of villages which have had disease outbreaks in a particular month during the last five years as part of an early warning system.

An insurance programme has been introduced to provide protection to farmers against the death of their animals. It is implemented in all districts covering all livestock species but is limited to five animals per beneficiary; 600,000 animals were insured in 2017.

No risk analysis is being undertaken to support the management and delivery of the priority disease control programmes (FMD, PPR, CSF etc.) with no formal reviews being undertaken of the disease epidemiology or progress of the control programmes. Nor is risk analysis being undertaken to assess the risk from animal movements and possible options for their mitigation; this applies both within the India supply chains and to informal trade across international borders.

Strengths:

- Qualitative import risk analysis in place
- AQCS carry out risk management of imports according to the assessed risk
- NADRES uses a risk assessment approach to forecast likely disease outbreaks

Weaknesses:

- No formal established risk analysis unit
- No staff trained in risk analysis
- No risk analysis assessment for disease surveillance and control programmes, nor for food safety and veterinary public health
- Limited use of economic impact assessments with risk analysis

Recommendations:

- Establish risk analysis units at DADF and in the state AHDs with specialist trained staff
- Undertake risk analysis to target priority programmes and activities for disease surveillance and control programmes including veterinary public health
- Conduct a review and validation of the outputs of NADRES

II-4 Quarantine and border security *The authority and capability of the VS to prevent the entry and spread of diseases and other hazards of animals and animal products.*	Levels of advancement
	1. The VS cannot apply any type of quarantine or border security procedures for animals or animal products with their neighbouring countries or trading partners.
	2. The VS can establish and apply quarantine and border security procedures; however, these are generally based neither on international standards nor on a risk analysis.
	3. The VS can establish and apply quarantine and border security procedures based on international standards, but the procedures do not systematically address illegal activities14 relating to the import of animals and animal products.
	4. The VS can establish and apply quarantine and border security procedures which systematically address legal pathways and illegal activities.
	5. The VS work with their neighbouring countries and trading partners to establish, apply and audit quarantine and border security procedures which systematically address all risks identified.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SKA11, HB6, HB8, HB9, HB10, HB11, HB12, HB13, HLB20-24, JPW40, JPW45, JW3, SK11, JPW40, JPW63, PHLB10, P1JW, P39JW and discussion with DADF staff.

Findings:

The Livestock Importation Act of 1896 as amended by the 'Livestock Importation (Amendment) Act (1953) and the Livestock Importation (Amendment) Act (2001) provides the legal mandate for controlling imports. There are also two SOPs: 'Procedure for import of livestock products' (2014) and 'Procedures for import of livestock (2014).

There are six Animal Quarantine and Certification Service (AQCS) designated live animal quarantine and border inspection facilities (Delhi, Chennai, Kolkata, Mumbai, Bengaluru and Hyderabad). AQCS manages the import of all species including equine, bovine, canine, ovine, porcine, caprine, rodents, laboratory animals, poultry and also captive wild animals and birds; also included are aquatic animals and any other animal, which may be specified by the Central Government by notification in the Official Gazette. Advance notification is mandatory for all livestock arriving by plane and AQCS must authorise clearance to customs prior to quarantine.

Table 15: Facilities at AQCS stations* (numbers of animals that can be accommodated)

	Species	New Delhi	Chennai	Mumbai	Kolkata
1	Cattle	48	48	14	38
2	Sheep & Goat	300	270	48	100
3	Dogs/Cats	10	10	16	3
4	Horses	20	20	20	-
5	Poultry/Birds	250	100	320	-
6	Pigs	100	60	48	100
7	Laboratory Animals	500	400	-	-
8	Miscellaneous animals	One shed with open space	-	-	-

* Excludes Hyderabad and Bangalore as these are not yet fully operational

A new border quarantine facility is planned for the Pakistan/India border in the Punjab. The land has been purchased and funds approved but not yet released.

Under the six AQCS stations there are 18 authorised Border Inspection Posts (BIPs) responsible for the import of live animals and animal products but there are many uncontrolled routes. For example, there is no border inspection post established between Mizoram, India

14 Illegal activities include attempts to gain entry for animals or animal products other than through legal entry points and/or using certification and/or other procedures not meeting the country's requirements.

and Myanmar in spite of the illegal import of large numbers of slaughter pigs and some cattle acknowledged by the veterinary authorities.

The procedures to be followed are laid down in Notification S.O.1495 (2014). There is mandatory pre-arrival notification for all products. The AQCS website gives excellent information of import requirements[15] with clear definition of livestock products (animal origin defined as meat and animal products of all kinds, including embryos, ova, semen, feathers, wool, hide, bristles, animal feeds and supplements, and any other animal products, which may be specified by the Central Government by notification in the official Gazette).

The Directorate General of Foreign Trade (DGFT) of the Ministry of Trade and Commerce, processes proposals for import, export, manufacturing and marketing of livestock and products of animal origin including vaccines, drugs and biologicals. The views of the DADF are taken into account for the import of items such as animals, germplasm and other items categorised as 'restricted' require a licence from the DG of Foreign Trade, or the Drug Controller of India in the case of drugs. The conditions of the health certificate are the responsibility of DADF.

Import licences (so called 'open licences') are granted by DADF for individual animal consignments or for products of animal origin for a period of up to six months or one year. The importer applies for the import licence on line[16]. There are general import guidelines laid down by DADF and standard health conditions and certification in various notifications. These are published in Hindi and English. Conditions are laid down for the import of bovines, bovine embryos, poultry, day old chicks, hatching eggs, poultry meat and poultry meat products, equines from USA, and feathers. There are also guidelines for imports of poultry and poultry products from countries where avian influenza has occurred, recognition of pest or disease free areas or low pest or disease prevalence, guidelines for recognition of disease free areas, zones and compartments together with a questionnaire to be completed by the exporting country.

For dogs and cats, imports are allowed of two pets with home quarantine, subject to the condition that there has been two years of residence in the country of origin. Day old chicks and hatching eggs are also quarantined off site at the hatchery or rearing unit.

To mitigate the risk from incoming passengers, AQCS requires that a declaration is signed; there are no scanners or sniffer dogs to support effective checks. (Note that there are sniffer dogs in use for the detection of drugs and explosives)

The 'Single Window Project' with Customs became operational in April 2016 and uses Indian Customs electronic data exchange systems with Customs product identification codes; IDs are issued for data entry and clearance to authorised staff.

AQCS carries out risk assessments for imports and implements import testing with 23% being compulsorily checked, 38% randomly checked and 39% with no testing. AQCS has the right to inspect and test any cargo. The AQCS staff are under the direct authority of DADF; they operate 24 hours a day.

Quarantine follows a standard testing protocol as follows:

Animals in quarantine for 30 days:

- Cattle/Buffalo: BVD, MCF, RVF, CCHF, SV;
- Sheep/Goat: BVD, RVF, CCHF, CAE, SV;
- Pig: PRRS influenza Type A, pseudorabies.
- Rabbit: RHD.
- Poultry: HPAI.

[15] http://aqcsindia.gov.in
[16] https://sip.nic.in.

Products:
- Poultry meat: HPAI
- Lamb meat: MCF, NSD, RVF, CAE
- Pig meat: PRRS, influenza Type A
- Bull Semen: BVD, SV
- Bovine Serum: BVD,
- Pig Semen: PRRS, pseudorabies.

AQCS works with a number of laboratories as required including:
- NIHSAD (National Institute of High Security Animal Disease), Bhopal
- NRCE (National Research Centre on Equines), Hisar
- CDDL (Central Disease Diagnosis Laboratory), IVRI, Bareilly
- RDDLs (Regional Disease Diagnosis Laboratories)
- Veterinary colleges.

In contrast with the effective level of control at air and sea ports there is little/no control at the land borders.

International land border control is implemented by the armed forces under various units: Border Security Force (Pakistan, Bangladesh and Myanmar), Sahastra Seema Bal or 'SSB' (Nepal and Bhutan), Indo-Tibetan (China) and Myanmar. The focus of these forces is on international security and the movement of people; there are currently no operational border inspection posts or personnel that focus on managing the movement of animals and animal products.

The risks of disease incursion across land borders are generally regarded by the VS as minimal though no risk assessment has been undertaken and there is widespread informal information of movements across international borders both into and out of India.

In addition, PRRS is regarded as having been introduced into India from Myanmar with an ongoing outbreak occurring in Mizoram during the mission, and FMD virus strains first detected in India have subsequently been identified in South-East Asia. Some animals are being detected at border crossings by the security forces; if this occurs then the animals may be held for a few days before release. Overall, the management of land borders was seen to be variable.

Tripura

The border is mostly fenced with a 'no man's land' but there was no limitation on access to this area by local people. AQCS have an office at the Agartala border, but no AQCS officer has been appointed; the office does not have any laboratory facilities for the collection or processing of samples of any in-coming goods.

An AQCS officer from Kolkata comes to the border when a consignment arrives for inspection; as there is on-line pre-clearance advance warning is received of any goods requiring inspection. Most of the incoming trade is fresh, frozen and dried fish.

Mizoram

Mizoram has long borders with both Bangladesh and Myanmar. There are no AQCS staff in Mizoram as DADF does not have sufficient staff for deployment at any border crossing points. There is therefore no border control of animals or animal products into or out of Mizoram.

Almost all beef consumption (estimated more than 14,700 tons in 2016/17) in Mizoram is said to be from unauthorised cattle import from Myanmar as there is limited local production. The last outbreak of FMD (2015) is considered to have been caused by cattle imported for slaughter from Myanmar.

Assam

No border control with Bhutan as there is not considered to be any disease risk. Vehicles cross the border freely with no controls

In addition to the above, there was widespread anecdotal evidence that cattle were moving into Bangladesh with no control from a number of states.

No information was available to the mission on seizures at BIPs or any penalties imposed.

Strengths:

- AQCS staff are motivated and professional
- Standard import conditions and health certificates available
- Documented procedures for import including list of BIPs, designated disease free areas, zoning and compartments
- Excellent web site for imports and import procedures
- Transparent risk analysis for checks and controls at BIPs
- Good quarantine facilities at major sea and air ports

Weaknesses:

- Weak control at land borders with illegal movement of animals
- Limited use of new techniques
- Insufficient liaison with other border agencies
- Inadequate post-import traceability and feedback mechanisms
- Identification and recognition of low risk areas for allowing imports not carried out

Recommendations:

- Improve control of international land borders and implement effective control measures including the reduction in illegal movements of animals
- Improve liaison with other border agencies and develop programme to reduce illegal imports
- Consider introducing the use of scanners and/or sniffer dogs for improved control over ‘imports’ by passengers at air and sea ports
- Improve post-import traceability and feedback mechanisms
- Carry out pre-export technical audits of manufacturing units in country of origin including steps to ensure source, traceability, disease diagnosis, testing, etc.

II-5 Epidemiological surveillance and early detection *The authority and capability of the VS to determine, verify and report on the sanitary status of the animal populations, including wildlife, under their mandate.* **A. Passive epidemiological surveillance**	**Levels of advancement**
	1. The VS have no passive surveillance programme.
	2. The VS conduct passive surveillance for some relevant diseases and have the capacity to produce national reports on some diseases.
	3. The VS conduct passive surveillance in compliance with OIE standards for some relevant diseases at the national level through appropriate networks in the field, whereby samples from suspect cases are collected and sent for laboratory diagnosis with evidence of correct results obtained. The VS have a basic national disease reporting system.
	4. The VS conduct passive surveillance and report at the national level in compliance with OIE standards for most relevant diseases. Producers and other interested parties are aware of and comply with their obligation to report the suspicion and occurrence of notifiable diseases to the VS.
	5. The VS regularly report to producers and other interested parties and the international community (where applicable) on the findings of passive surveillance programmes.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SM21, SGU3, SGU12, SKA6, SKA 16; SUP4, JPW3, JPW9, JPW13, JPW16, JPW24, JPW26, JPW43, JPW44, JPW62, JPW70, JPW80, SG47, HLB6, SG37, HP1, PHLB23, P10JW.

Findings:

General

The DADF and the state AHDs have an extensive network of veterinarians and veterinary para-professionals operating at the different administrative levels – district veterinary hospitals, block veterinary clinics and often also at the village veterinary offices..

The coverage of veterinarians/veterinary para-professionals is complemented by the extensive use of mobile veterinary clinics; these are operated by various organisations including the states, the Emergency Management and Research Institutes (EMRIs), milk federation and the veterinary colleges. A number of states are increasing the numbers of mobile clinics to ensure veterinary services are more readily available to the farmers.

Disease reports are prepared, usually as paper records, and form the foundation of the passive surveillance system. Monthly summary reports are prepared for 45 diseases. No wildlife disease findings are included as this is the mandate of the Ministry of Environment, Forest and Climate Change.

Reporting of suspected disease outbreaks is facilitated by direct communication by mobile phone or apps to the district office and, as required, to the state and nationally. The alert should initiate a field response team to investigate the case and take samples, if required, for laboratory testing and disease confirmation. Numbers of disease investigations are listed in state monthly reports. During visits, however, evidence was found that many cases are not confirmed by laboratory diagnosis but categorised on the basis of assumptions, e.g. sudden death of birds to be Newcastle disease, salivation and sores on hoof and mouth to be FMD.

Disease report data is captured as standardised paper reports. To streamline disease reporting to DADF, the National Animal Disease Reporting System (NADRS) was introduced in 2012. The structure of NADRS is shown in Figure 7 (below). This IT system has been installed at 7,032 ‘nodes’ at block level across the country. Animal disease information reported by veterinary hospitals, dispensaries, field veterinarian and veterinary para-professionals is collected at block level and entered into NADRS, then validated by the district office, and again at the state level before being forwarded to the central level.

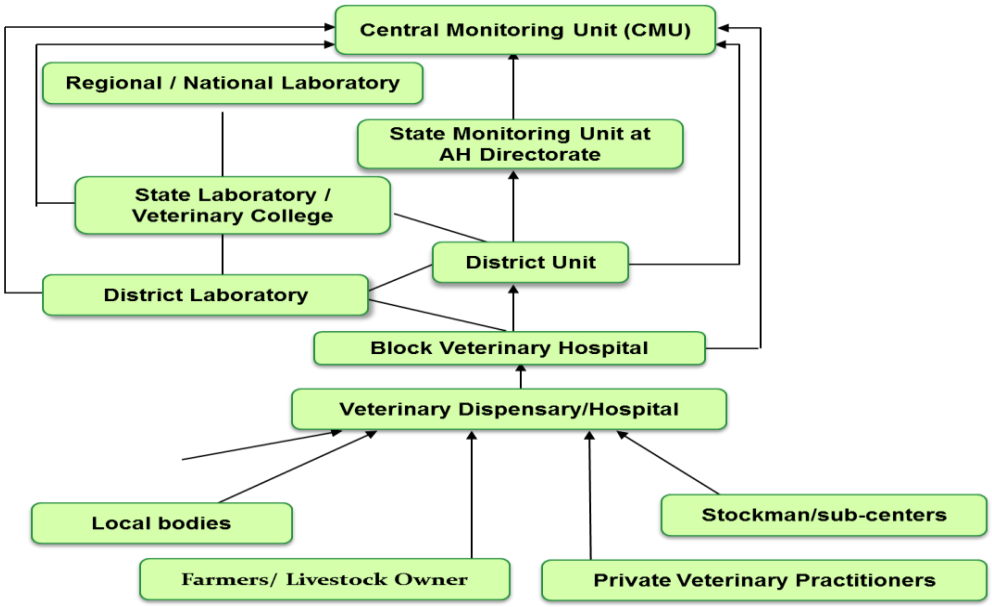
The limited field coverage of veterinarians and veterinary para-professionals in many states compromises the competence of passive surveillance, early detection of disease outbreaks and suspected notifiable diseases. (See also CCI-1A and CCI-1B)

The functionality of NADRS is further compromised by many problems such as lack of power and connectivity, theft of hardware, lightning, etc. DADF has attempted to address the connectivity problem by changing the internet provider at considerable cost, however, this remains a major problem. In some states it was estimated that 70% of block nodes were not working and problems were also occurring at district and state levels (e.g. Uttarakhand, Uttar Pradesh and Assam).

Following feedback from users, the NADRS software was reviewed in 2018. Passive surveillance data for the 45 priority diseases is required along with 'nil reports', but veterinary clinic outpatient reporting is no longer required. The new version of NADRS is being trialled in five states.

As a further development, a mobile app of the new NADRS has been developed and is expected to be in use by field NADRS nodes this year (2018).

Figure 7: NADRS data flow



Each block is required to provide a monthly report to the district on disease investigations, vaccinations, artificial insemination, pregnancy diagnosis and calves born. Districts validate these reports and send them on to the state. The state prepares an Animal Disease State Report (ADSR) on the 45 diseases from all districts every month and sends this to DADF. It was noted that many of these reports were not complete or not sent in.

Since January 2018, DADF has requested additional information on 'outbreaks'. There is some confusion over 'outbreak' and 'case' reporting that is the distinction between an outbreak in a production or epidemiological unit or a count of number of animals affected (cases).

DADF compares ADSR data with NADRS data and if there are inconsistencies, inquiries are made with the state. The consolidated data is used to report to OIE. The ADSR reports are still regarded as the main source of information from the field.

Specific observations

Brucellosis is a notifiable disease but reporting and investigation of cases of abortion is very irregular since veterinary para-professionals working at the village level do not always report cases of abortion; nor do farmers as they know from experience that the service providers can do little to help in such cases.

Rabies is a notifiable disease in India. Figures on human death due to rabies caused by dog bites differ widely from as high as 20,000 per year to only a few hundred. Vaccination rates are very low with a high rate of post exposure prophylaxis vaccination being used in people

and also being given to ruminants. Integrated surveillance between human and animal health is required to better asses and manage the situation.

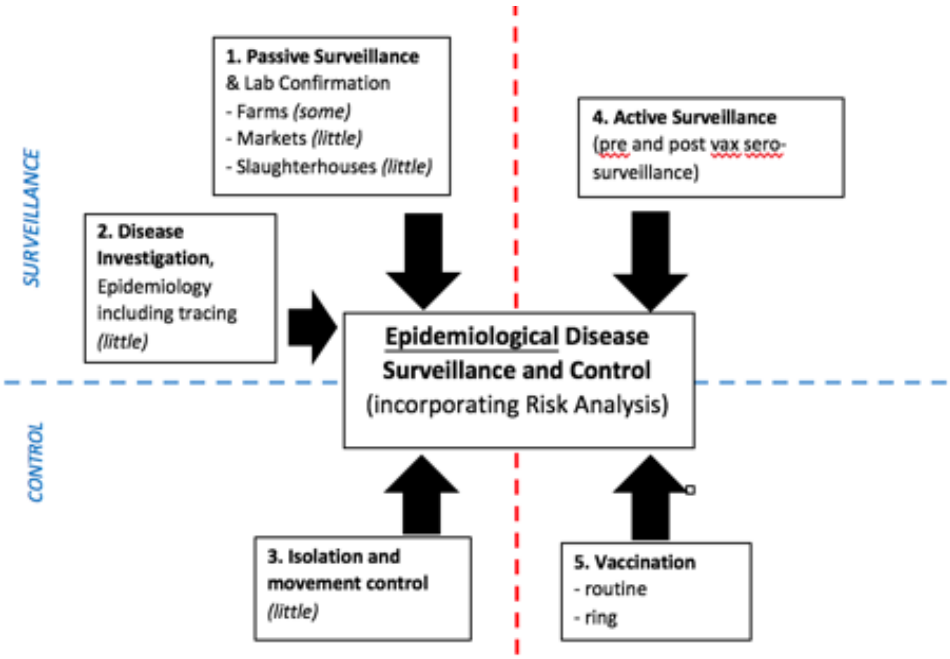
Extension and treatment for equines is being carried out in several states by NGOs, such as The Brooke; they conduct tests on diseased animals. However, diseases other than glanders, although usually reported to the veterinary officers, are not being entered into NADRS.

There is no public access to disease reporting or the animal health status in a given state through NADRS; the only source for this information is the DADF annual report or OIE website.

Few surveillance activities are undertaken at aggregation points such as livestock markets and slaughterhouses. The markets are variously under the control of municipal authorities, market overseers and traders with little presence of the veterinary services as health certification are not mandatory.

Overall, the surveillance focus is on disease control using vaccination with some active sero-surveillance, rather than an integrated approach using also passive surveillance/disease investigation.

Figure 8: Schema showing cross cutting needs for disease surveillance and control



Strengths:

- Extensive network of veterinarians and veterinary para-professionals in the field in most areas – although some rural and tribal areas are not well served
- There is a legal mandate to report notifiable diseases
- Data capture required in NADRS from all field veterinary units at block level

Weaknesses:

- Assumptions made on clinical signs with no laboratory testing e.g. sudden death in poultry is assumed to be ND and possible FMD cases not being tested
- Passive (and active) surveillance data is not sufficiently analysed for use in the adjustment of control programmes
- NADRS compromised by poor connectivity, loss of desktop computers, electricity cuts
- No reporting on wildlife – as this falls under the Ministry of Environment, Forest and Climate Change

- Duplication of work as staff are obliged to enter disease reports both on paper for the monthly ADSR and into NADRS
- Poor data capture on disease incidence from other, non-government stakeholders leading to underreporting (e.g. on equines)
- Limited access to NADRS disease information – only available in the DADF annual report and some irregular, online publications from NIVEDI
- Reporting is focused on the 45 diseases and not on syndromic reporting
- No consideration of aggregation points (e.g. markets) and their role in disease surveillance

Recommendations:

- Develop syndromic reporting from all staff, particularly veterinary para-professionals
- Improve data capture, merging with active surveillance data and analysis to assess effectiveness of surveillance and control programmes
- Address internet, hardware and power problems with NADRS
- Continue upgrading ease of use of NADRS and develop syndromic reporting
- Allow data capture into NADRS from other stakeholders and routine surveillance schemes such as ADMAS
- Assure that reporting by veterinary para-professionals is collected at block level and entered into NADRS
- Expand NADRS to include all disease information, using syndromic reporting, not only for notifiable diseases
- Move towards non-paper based data capture and monthly reporting
- Develop NADRS further to become a fully integrated animal health information system that combines active and passive surveillance data – including sources such as animal movements, markets, abattoirs, state farms, wildlife, etc.

II-5 Epidemiological surveillance and early detection *The authority and capability of the VS to determine, verify and report on the sanitary status of the animal populations, including wildlife, under their mandate.* **B. Active epidemiological surveillance**	**Levels of advancement**
	1. The VS have no active surveillance programme.
	2. The VS conduct active surveillance for some relevant diseases (of economic and zoonotic importance) but apply it only in a part of susceptible populations and/or do not update it regularly.
	3. The VS conduct active surveillance in compliance with scientific principles and OIE standards for some relevant diseases and apply it to all susceptible populations but do not update it regularly.
	4. The VS conduct active surveillance in compliance with scientific principles and OIE standards for some relevant diseases, apply it to all susceptible populations, update it regularly and report the results systematically.
	5. The VS conduct active surveillance for most or all relevant diseases and apply it to all susceptible populations. The surveillance programmes are evaluated and meet the country's OIE obligations.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): JPW9, JPW12, JPW13, JPW43, JPW 44; JPW70, JPW85, SG 5, SG13, SG37. 31; SKA22; HP1, SP5, HLB 3, HLB5, HLB16, SG 39,46;53; SKA11, SKA16, SKA22, SKA30, SM7, SM13, JW19, SGU1, SGU5, SGU8, SGU9, SGU12, SUP4, SK9, P8JW, P10JW, P28JW.

Findings:

Central

The national disease control programmes (schemes) implemented by DADF for FMD, PPR, HPAI, RP, BSE, brucellosis, CSF, have well-defined active surveillance programmes. The programmes are designed with input from specialised ICAR institutes and other technical experts and are recommended for implementation to the state AHDs.

Active surveillance for these diseases is carried out with the support of the network of government laboratories. The Central Disease Diagnostic Laboratory (CDDL [17]) at IVRI (Izatnagar) is the lead laboratory with five regional laboratories (RDDLs). These laboratories act as reference laboratories for the State (SDDL) and District Disease Laboratories (DDLs) for sample testing; some SDDLs have been authorised to undertake the testing. Recommendations for surveillance for other diseases of economic importance are also provided by the central level to the states, e.g. national glanders surveillance.

In addition, states have their own funding and can develop their own active surveillance programmes in support of centrally led programmes, e.g. brucellosis, or for specific diseases of concern e.g. Kyasanur Forest disease in Karnataka.

Active surveillance is also carried out for a number of economically important bacterial, viral and parasitic diseases under the Animal Disease Monitoring and Surveillance Programme (ADMAS) based at NIVEDI, Bangalore. This programme is implemented through a network of 31 centres covering all states and UTs – these laboratories are variously managed by ICAR, state AHD and veterinary universities.

NIVEDI has the mandate to provide research, diagnostic, epidemiology, data analysis and forecasting support to states. It contributes to active surveillance data collection for brucellosis (in all species) and IBR, and, under different funding schemes but not regularly testing for, bovine trypanosomosis), PPR (in addition to the CP surveillance), bluetongue, IBR and leptospirosis (small ruminants) is also undertaken. For this, they develop a sampling plan each year based on the disease prevalence and geographical and species distribution in previous years. The sampling frames in some years cover all livestock species, in other years only selected species, e.g. in the year 2017/18 only sheep and goats, while in the previous year it

[17] Also referred to as Centre for Animal Disease Research and Diagnosis (CADR)

covered all large and small ruminants and pigs. For 2018/19 it is planned to sample mainly pigs for CSF, PRRS, brucellosis and, yet to be confirmed, Japanese encephalitis; other species will be sampled under specific projects. NIVEDI provides its centres with sampling frames and an overall sample target for the year. Samples are to be collected monthly to achieve the annual target. Not all states collect samples for all diseases and many samples are tested for several diseases at the same time, e.g. trypanosomosis surveillance was done only in north-eastern states and a few southern states in 2017/18 in bovine. The variations in coverage for diseases and species are partly due to epidemiological considerations but also due to availability of test kits and funding. NIVEDI provides some funding to its centres, but the centres need additional state funding to carry out the surveillance. The samples are either tested at NIVEDI, CDDL or the RDDLs. The results of these surveillance activities are reported back to the centres when they become available, and are being used for the NADRES forewarning system and to advise the state AHDs on measures to be taken. The centres should report positive results back to field veterinarians responsible for the respective villages.

The most comprehensive surveillance data under ADMAS is available for brucellosis in bovines with data available since 2006. Data for small ruminants and pigs are available only intermittently. In the frame of this programme the S19 vaccination of young calves was introduced in 2010. NIVEDI carries out post-vaccination sero-monitoring to establish the effectiveness of these vaccinations.

Data from the different schemes that contribute to active disease surveillance are compiled at state AHD level, at RDDLs and forwarded to DADF for final compilation. Not all active surveillance data ends up in NADRS, as results do not become available in short timeframes, so that positive findings resulting from active surveillance might not be included and lead to underreporting.

On the other hand, NIVEDI receives ADMAS reports from the states and they compile the All India Coordinated Research Project (AICRP) Report which combines information from active surveillance for only selected diseases in specific years (e.g. for 2015/16 brucellosis and IBR) and disease reporting (NADRS) for selected diseases to depict the disease situation in all states. Although this provides good information on disease occurrence per state, and is available to the public, it is not uniform regarding the diseases and hence difficult to compare across states. Also, the last report in the public domain dates from 2014/15.

Other specific active surveillance programmes

The HPAI active surveillance programme has undergone a series of revisions since its inception in 2005 with changes being made in 2006, 2012 and 2015. The states implement the 'Preparedness Plan' which provides the recommended sampling frame (e.g. 60 cloacal swabs and 60 environmental samples for live bird markets) and the details of surveillance activities, such as visits to commercial farms, backyard farms, markets and bird sanctuaries or water bodies with migratory birds. The sampling target set by central level might be adapted by state level.

All state and central breeding stations (semen production centres and cattle breeding centres) have a strict surveillance and testing programme for brucellosis, TB, Johne's Disease, trichomoniasis, FMD, campylobacter, IBR and BVD. These samples are tested in the nearest RDDL and results serve mainly to certify stations and individual animals, however they are also compiled at regional levels and forwarded to DADF. Data by Region for TB, Johne's, brucellosis, campylobacter, trichomonas and IBR for the period 2013 to 2018 were made available to the team.

FMD surveillance is carried out under the FMD-CP and planned and overseen by IVRI-Mukteshwar. The surveillance programme only targets buffalo and cattle, and not small ruminants or pigs. The FMD-CP guideline provides the sampling frame at central level. Samples are collected by the SDDLs and DDLs and tested in a number of laboratories across the country. (See also CC II-7)

NRCE carries out routine active surveillance for several equine diseases (glanders, EIA, EI, Japanese Encephalitis, surra, piroplasmosis, Equine Herpesvirus 1 and 4). In response to the ongoing glanders outbreaks, the number of samples was drastically increased and 29,873 glanders samples were collected from 17 states in the period January 2017 to April 2018, of which 464 from 11 states were positive. NRCE data are reported back to the state AHD, the district where samples were collected and to DADF.

Annual reports for reconfirmation of India's disease free status for AHS, BSE and CBPP are submitted to the OIE on the basis of ongoing surveillance programmes. (See also CCII-7). India has had an official OIE 'negligible BSE risk status' since 2017. Surveillance is in line with OIE standards and is carried out by the RDDLs. In 2017 the sources/numbers of samples tested were rendering plants (49), slaughterhouses (983), casual slaughter (21) and from suspected cases (496).

Results of ante- and post mortem inspection of animals are not reported to state AHDs or DADF and are therefore not being used effectively for disease surveillance. The prevalence and zoonotic (TB, hydatidosis, etc.) and other important notifiable diseases such as CBPP may readily be detected at post mortem inspections.

Strengths:

- Ongoing active surveillance programmes for priority diseases and diseases under control programmes are implemented by different institutions
- Extensive time-series data available as the NIVEDI managed ADMAS surveillance programme has been running since 1987
- Surveillance data being used to forecast the disease situation under NADRES and to provide the states and DADF with disease prevalence information
- The extensive network of laboratories in the country allows for surveillance samples to be tested close to the point of collection for many diseases

Weaknesses:

- Fragmented reporting of active surveillance data, due to different funding schemes and reporting obligations
- Active (and passive) surveillance data is not sufficiently analysed for use in the adjustment of control programmes
- Apparent underreporting of notifiable diseases as ADMAS and NADRS operate separately and ADMAS does not feed directly into NADRS
- No evidence of coordination of data resulting from testing for some diseases (e.g. brucellosis) that are collected by many different stakeholders
- No active surveillance for FMD in small ruminants or pigs
- Limited use of slaughterhouse ante- and post mortem inspection data

Recommendations:

- Improve data capture, merging and analysis to assess effectiveness of surveillance and control programmes
- Review and integrate ADMAS and NADRS data systems to provide more accurate disease reporting
- Conduct epidemiological analyses on the long time-series of data collected by ADMAS
- Integrate surveillance data into a national animal health information system
- Consider establishing an epidemiology unit at DADF
- Amend the glanders surveillance programme and use risk-based surveillance to target high risk areas and states and focus on work horses as these are the only ones affected.

II-6 Emergency response *The authority and capability of the VS to respond rapidly to a sanitary emergency (such as a significant disease outbreak or food safety emergency).*	Levels of advancement
	1. The VS have no field network or established procedure to determine whether a sanitary emergency exists or the authority to declare such an emergency and respond appropriately.
	2. The VS have a field network and an established procedure to determine whether or not a sanitary emergency exists, but lack the necessary legal and financial support to respond appropriately.
	3. The VS have the legal framework and financial support to respond rapidly to sanitary emergencies, but the response is not coordinated through a chain of command. They may have national contingency plans for some exotic diseases but they are not updated/tested.
	4. The VS have an established procedure to make timely decisions on whether or not a sanitary emergency exists. The VS have the legal framework and financial support to respond rapidly to sanitary emergencies through a chain of command. They have national contingency plans for some exotic diseases that are regularly updated/tested.
	5. The VS have national contingency plans for all diseases of concern, including coordinated actions with relevant Competent Authorities, all producers and other interested parties through a chain of command. These are regularly updated, tested and audited

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SG 1, 5, 50

Findings:

General

Contingency planning, emergency preparedness and response is covered by the Animal Health Act (2009) which requires the immediate reporting of disease outbreaks with control and containment operations to be initiated immediately, including movement restrictions. The Act also provides for emergency funding.

An effective chain of command exists for emergency response from national level (DADF) to the states, divisions/districts, blocks and the field. The delegation of activities within the government sector is well understood and works well; however, reporting by field services can be variable in timeliness and quality. Whole of Government response is available as required through coordination with other government agencies and institutes.

The field emergency response is often led by ‘rapid response teams’ (RRTs) which are responsible for operations such as awareness and information, disease surveillance, ring vaccinations, cleaning and disinfection and the imposition of movement restrictions.

A specific contingency plan for HPAI, ‘The Action Plan for the Preparedness, Control and Containment of Avian Influenza’ was first developed in 2005 and has since undergone a series of revisions, most recently in 2015. The Action Plan covers public awareness, disease detection, surveillance and control and restocking times – now adjusted to comply with OIE guidelines.

In the case of a suspect HPAI outbreak, all veterinary officers in the district are required to report to the state AHD or district animal health office by phone, fax or e-mail, of any unusual sickness or mortality in poultry and wild birds.

The contingency plan requires a quick start to the coordination process with the District Magistrate, District Collector and Deputy Commissioner required to hold an emergency meeting with the Senior Superintendent of Police, Chief Medical Officer, Chief Veterinary Officer and officers of other line departments such as the heads of panchayats, local bodies and NGO’s; they are to establish an RRT.

Since 2006 India has had multiple outbreaks of HPAI and has implemented effective control measures with culling of the affected and surrounding area flocks, movement control, cleaning and disinfection, payment of compensation and increased public awareness. Individual emergency outbreaks have apparently been well controlled and country freedom regained, though further outbreaks have occurred. It is understood that DADF has reports on post-outbreak debriefs with recommendations on the needed changes but none were provided to the PVS mission.

A contingency plan has also been developed for FMD. This plan covers preparedness and response activities such as vaccine banks, quarantine/isolation of animals, animal identification and ring vaccination.

In glanders cases, following disease confirmation, an RRT is formed and the public health agency notified about any persons who have been in contact with the horse. The horse is humanely euthanased and the compensation fund activated.

Emergency response has been supported by specialist laboratories, such as NIHSAD which have contributed significantly to the early detection of exotic animal diseases.

In support of the Government mechanism to react to a disease outbreak emergency there are also public private partnership (PPP) initiatives such as the GVK EMRI emergency number 1962, which is currently operational in Gujarat, Tamil Nadu and Telangana, being initiated in Uttar Pradesh and is to be expanded to more states. (see also III-1).

In addition, all visited states have central call-in numbers in case of disease emergencies (see also III-1).
In addition to animal disease emergencies, disaster relief is available following civil disasters such as floods and cyclones. In natural disaster prone states such as Uttar Pradesh (annual floods and draught) and Uttarakhand (cloud bursts, floods), Assam and Madhya Pradesh there are disaster mitigation centres at state and district levels in which AHD CVOs are members. In Uttarakhand the district disaster management committee meets monthly and carries out simulation exercises.

Strengths:

- Well defined and operational chain of command allows for direct effective communication with DADF from the field
- Experienced emergency response to HPAI outbreaks in several areas in recent years
- Funds available for the emergency response including compensation for culled animals

Weaknesses:

- Compensation for losses of animals due to diseases other than HPAI and glanders not available
- Little training or simulation exercises to test contingency plans and train staff and stakeholders
- No reviews of emergency responses to identify strengths and opportunities for improvement
- Contingency plans not available for all necessary diseases

Recommendations:

- Constitute a ‘national animal disease emergency preparedness planning committee’ with clear terms of reference, membership and business rules
- Extend compensation to cover all animals culled as the result of an emergency disease response
- Develop a training programme on emergency preparedness and response for all staff, according to their roles, and implement necessary training
- Develop contingency plans for all necessary diseases including unknown emerging diseases

II-7 Disease prevention, control and eradication *The authority and capability of the VS to actively perform actions to prevent, control or eradicate OIE listed diseases and/or to demonstrate that the country or a zone are free of relevant diseases.*	Levels of advancement
	1. The VS have no authority or capability to prevent, control or eradicate animal diseases.
	2. The VS implement prevention, control or eradication programmes for some diseases and/or in some areas with little or no scientific evaluation of their efficacy and efficiency.
	3. The VS implement prevention, control or eradication programmes for some diseases and/or in some areas with scientific evaluation of their efficacy and efficiency.
	4. The VS implement prevention, control or eradication programmes for all relevant diseases but with scientific evaluation of their efficacy and efficiency of some programmes.
	5. The VS implement prevention, control or eradication programmes for all relevant diseases with scientific evaluation of their efficacy and efficiency consistent with relevant OIE international standards.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SM-2, 19, 21; SG 1,4,6,7, 31; SK 8,10, 16, 17; SKA17, 24; SG 34,39,40; 41-43; SG44; SUK1,2, SG45; HUP8; SG49, 51; 52; SG37; SRA1

Findings:

General

There are clearly defined livestock health and disease control programmes (LH&DC) developed at DADF and provided to the state AHDs for FMD (FMD-CP), PPR (PPR-CP), brucellosis, CSF and RP with surveillance, control measures including vaccination and monitoring. Other diseases of major economic importance in poultry and livestock are covered under the ASCAD programme.

The implementation of the programmes is the responsibility of the state AHDs. Regular meetings (face to face or by teleconference) are held with DADF to review programme progress.

The funding and supply of materials and vaccines by DADF to the states for animal disease control has increased substantially over the last few years. This has particularly focused on FMD control, which will receive four billion INR out of the five billion INR allocation to the LH&DC scheme, plus an additional allocation of 500 million INR from the RKVY programme in the 2017/18 budget – almost double the amount of the previous year (2.6 billion).

Most states have capacity to produce vaccines for the diseases of economic importance according to the demand in the state, except for FMD vaccine. Surplus vaccine is either sold to private farmers (poultry) or other states that do not have sufficient capacity.

The ability to control diseases in cattle is limited by the inability to slaughter cattle in many states and the difficulty of achieving high rates of vaccination coverage in stray cattle. In some states cows found positive for brucellosis and TB are moved to gaushalas or pinarapole (municipal cow shelters) where they live until they die; in some states specific gaushalas are available for their management. FMD infected cattle are not slaughtered but provided with palliative treatment; control measures such as ring vaccination, movement control and surveillance will be variously undertaken.

The role of gaushalas and pinarapoles varies from state to state, with some being operated as isolation stations for diseased animals, mixing different diseases in one place (e.g. Karnataka) and others as productive units for milk, dung and urine (e.g. Gujarat), as breeding stations for indigenous cattle (e.g. Punjab) or as cow shelters only (e.g. Haryana and Uttar Pradesh).

India is recognised internationally as free of a number of major diseases including rinderpest, BSE, CBPP and AHS. Prevention and surveillance programmes are in place to protect and

monitor their disease free status. India submits annual reconfirmation information for these diseases to the OIE.

The special central disease control programmes for other diseases are described below, Glanders is also included as there is an ongoing outbreak in 2018.

FMD

FMD is endemic in much of India.

Surveillance indicates that the southern, north-eastern and eastern regions are most affected. Virus characterisation indicates that in the period 2012- 2017, 2% of outbreaks were serotype A, 5% Asia 1 and 93% type O.

A programme for FMD control has been carried out since 2003, initially in 54 districts of eight States and five UTs and then expanded in 2010 to 167 districts. The India FMD-CP was endorsed by OIE in May 2015 and the programme then expanded further in 2017/18 to cover the whole country.

There are different levels of control in different states. For example, the Punjab, a state which has been implementing a control programme of vaccination and other controls since 2003 borders Rajasthan, a state which only began its control programme in 2014/15. The Punjab wishes to be recognised as free from FMD with vaccination. An operational manual was provided to the states in June 2016 with the objectives, implementation, procurement of vaccine, sero-monitoring and awareness campaigns detailed. The programme requires biannual vaccination of cattle and buffalo, some states such as Kerala also include pigs. Other susceptible species (sheep, goat, pigs) are included in ring vaccinations, if an outbreak occurs.

Trivalent inactivated, oil adjuvant, FMD vaccine (Asia 1, O and A) is procured from private pharmaceutical companies through a tender procedure. The national reference FMD laboratory which is an OIE/FMD Reference laboratory, is situated at IVRI-Mukteshwar. This laboratory is supported by 32 network laboratories (all under ICAR). IVRI-Mukteshwar carries out all research, viral typing and characterisation of circulating field strains for vaccine matching and advises the vaccine producers if it is necessary to change the vaccine virus strains. This has not been necessary for some time. A limited number of vaccine batches per producer are quality tested at IVRI-Mukteshwar using challenge testing in 16 animals/per batch.

Vaccine is ordered according to the need of the states and distributed through a clearly structured distribution and cold chain system to the district level where it is usually stored in large quantities and further distributed to block and village level as required, avoiding long storage in local facilities.

Vaccination is carried out usually within one month by the state AHD with support from other organisations such as semen centres, research stations and breeding stations who vaccinate their own animals. In some states, due to remote and difficult to access areas, the vaccination round might take longer than the expected one month (e.g. Assam).

Monitoring of the FMD vaccination programme is undertaken by:

- The collection of base-level sera for pre-vaccination antibody testing; sampling is representative with the collection of samples from 10 cattle, 10 buffalo in each of 10 randomly selected villages per district (max 400 samples).
- Vaccinated animals are issued with an animal health card in which vaccination details are entered. The cards are specific to each state and have been in use for varying lengths of time (NB new standard cards being introduced). Vaccination may also be recorded in other ways, e.g. by marking the household (with paint/pen) with the number of the vaccination round plus number of animals (e.g. in Uttar Pradesh).

- At 21-30 days post-vaccination additional representative serum samples are taken. Samples are assayed for vaccine induced antibodies post-vaccination as compared to pre-vaccination levels.
- 200 samples/district are also tested for NSP (non-structural protein) by DIVA (differentiating infection in vaccinated animals) test to see if there is still circulating virus. Evidence in two states showed between 15.5%-35% NSP positive results. The high incidence of DIVA positive samples, usually interpreted as indicative of circulating virus, may result partly from repeated vaccinations of animals. Guidelines for NSP sampling have recently been adjusted to take samples only from animals of 6-12 months of age.

Further FMD surveillance has been undertaken with 2,000 – 3,000 sheep and goat blood samples being tested during the last two years in eight states for NSPs by Mukteshwar; a significant number were found to be positive suggesting that small ruminants may be a reservoir of infection but show few signs of disease and may play a significant role in the transmission of the virus.

While the SDDLs carried out the pre- and post-vaccination ELISA testing in the past, there has been a shortage of test-kits at the SDDLs over the last two years, therefore currently only Bangaluru Institute for Animal Health and Veterinary Biologicals carries out these tests. NSP testing is being carried out by the Mukteshwar network laboratories.

States also carry out active, targeted and passive surveillance for FMD and are required to report any suspected outbreak immediately, to carry out a disease investigation and to implement control measures if the disease is confirmed. Immediate control measures include ring vaccination usually in a radius of 5-10km, though this is not specified in the Technical Guidelines; some states also vaccinate small ruminants), movement ban and disinfection of the premises. The FMD-CP indicates that diseased animals must be separated and the premises disinfected; a stamping out policy is not practiced.

Export slaughterhouses for buffalo meat are situated in zones declared FMD-free by the state AHD, that is, these zones are not recognised by OIE. Currently three state zones consider themselves to be free with vaccination: Telangana and Andhra Pradesh (zone 1), Maharashtra (zone 2), and Punjab (zone 3). An OIE mission is foreseen for end June/July 2018 to assess the FMD-CP.

PPR

The control of PPR in the states has been funded under the ASCAD programme since 2003. Disease control with the aim of eradication was initiated under the 11th plan (2007-2012) and started as a central government programme in 2013/14 with vaccination in six states and all UTs. The programme requires one vaccination of 100% of all small ruminants followed by three subsequent annual vaccinations of 30% (offspring only). Under the 12th plan (2012-2017) the expansion to all states and UTs was planned. Only some states carry out post-vaccination sero-monitoring with test kits provided by NIVEDI. Technical guidelines have been provided by DADF to the states, but they are not specific regarding frequency of vaccination and sero-monitoring. Differences were found in states regarding vaccination schedules (annually or bi-annually).

Several states have the capacity to produce PPR vaccine according to their state needs including Kerala, Tamil Nadu, Karnataka and West Bengal; other states purchase vaccine through a tender process.

Shortage of vaccine in some, mainly southern, states has led to the interruption of the programme and the disease has tended to re-emerge in areas where earlier vaccination success had started to bring it under control.

Brucellosis

Serological surveys have revealed high prevalence rates of brucellosis in dairy cattle and a central control programme of vaccination was initiated under the 11th plan but implementation

has started in different years in the states; under the 12th plan the programme was supposed to be implemented countrywide but this has not been achieved.

Under the programme, all female calves, aged 6-12 months, are to be vaccinated using S-19 for the next 5 years. Currently this is only taking place in organised dairy farms and government farms.

Screening of pooled milk samples and bi-annual serological screening in dairy farms is also to be carried out under the programme. In some states, there has been a shortage of reagents to carry out the serological testing. The positive animals are supposed to be slaughtered (where permitted), isolated on the farm and male animals castrated, though there was little evidence that this was happening. If the farmer agrees they can be sent to the gaushallahs. There is no requirement for positive cattle to be identified and farmers are free to sell such animals.

Tests are regularly conducted for brucellosis, TB and Johne's disease in government farms, breeding stations, semen centres and gaushalas.

CSF

The CSF-CP was introduced in 2014/15 and is focused on the northeast states, with funding 90% central and 10% state; the aim is to vaccinate the entire pig population. Currently eight states are implementing a vaccination programme. Depending on the amount of vaccine available, it is intended that the scheme will be enlarged to the entire country in a phased approach. The production of vaccine is being increased by private companies and the Bangaluru Institute of Animal Health and Veterinary Biologicals.,.

Rabies

Rabies is recognised as a major public health problem, however the estimated numbers of human deaths from rabies vary greatly, ranging from more than 20,000 per year to only 86 (2016); in comparison only 27 cases in dogs were reported to OIE in 2016.

The Ministry of Health cooperates under the One Health approach with widespread use of post-exposure prophylaxis being available at rural clinics. Controlling rabies at source in dogs is the mandate of DADF and vaccination of dogs against rabies is carried out under ASCAD.

At state level, the Animal Birth Control (ABC) programme is implemented by the municipalities and a number of NGOs and includes sterilisation of dogs and their vaccination; neutered dogs are marked with a triangular notch in the tip of the ear. The numbers of ABC centres vary with some states only having them in major urban centres whereas others, such as Punjab have centres in more than half the districts.

Revaccination of stray dogs is a major challenge; the inability to euthanase unowned, stray dogs also makes the delivery of an effective rabies programme more difficult. Rabies vaccination campaigns are carried out as initiatives by state AHDs, e.g. on World Rabies Day, on World Veterinary Day and during livestock fairs. 'SPCA' and other NGOs are very active in many states and carry out rabies vaccination of stray dogs. All state veterinary units offer free rabies vaccine as part of their service. There is good vaccine coverage of pet dogs, but low coverage of stray dogs, particularly in rural areas. Stray dog vaccination is mainly outsourced to NGOs and therefore dependent on their areas of activity and coverage.

NCDC and DADF have signed a MoU on rabies control in 2016 but no coherent joint programme or coordinating committee has been developed and few joint activities are being implemented.

There was an OIE Twinning Programme between the Karnataka Veterinary, Animal and Fisheries Sciences University and APHA UK and CDC Atlanta. AHD Kerala also has a specialised rabies diagnostic laboratory (CDIO) servicing the state and also conducts diagnostic testing of human samples; it has developed a mobile rabies PCR unit which is used

in the field to test saliva samples of live animals, especially cattle who are often bitten by rabid dogs.

A further challenge to rabies control is the large reservoir in wildlife, such as in mongoose, civet cats, and monkeys.

Glanders

A glanders outbreak has been underway since October 2017 and has spread to 11 states. Glanders is a notifiable disease under the Prevention and Control of Infectious and Contagious Disease in Animal Act (2009). Compensation of 25,000 INR can be paid for a horse and 16,000 INR for a donkey euthanased due to glanders infection is paid under the ASCAD scheme as per the State Disaster Response fund/National Disaster Response fund norms on a 50:50 basis by the Central and State Government.

There are three laboratories recognised by central DADF for glanders testing: NRCE (Hisar) Royal Western India Turf Club (Hisar) and the RVC Meerut and ICAR-NRCE; the Pune laboratory also provides training to veterinarians on glanders diagnosis and control and is the reference laboratory for glanders in humans.

There were no outbreaks of glanders reported between 1988 and 2006 when the disease re-emerged and spread as sporadic cases in several states. In 2007, DADF developed rules on the implementation of the 1899 Act and guidelines for rigorous surveillance and control and declaration of freedom after an outbreak. These were updated with an action plan in 2016 since the cases were increasing and the action plan was distributed to all affected states with the order to start a state-wide surveillance and control programme. Under this programme the NRCE assumes the main responsibility to test the surveillance samples; Due to the high number of tests needed, the NRCE has made available their own ELISA kit to several state diagnostic laboratories (e.g. Sonipat Laboratory in Haryana; Veterinary Polyclinic in Jodhpur, Rajasthan) to speed up disease investigation and surveillance. It will also increase capacity of the RDDLs for glanders confirmatory diagnosis using Complement Fixation Tests (CFT).

The Veterinary Commission of Turf Authority states that no case of glanders has been seen for 40 years, based on their guidelines for sport horses. (Note that the Commission has no legal authority; it develops guidelines for respective sports.) However, the racing industry is affected by the frequently occurring movement bans due to the outbreaks of glanders in many states. Traders are also affected by the ban on horse fairs (e.g. Rajasthan). As the outbreak is not diminishing in working/local horses, DADF is in the process of revising the national programme for glanders eradication for the period 2018 – 2023.

HPAI/LPAI

The first case of H5N1 was recorded in 2006 and outbreaks have since occurred in 15 states. In 2016 outbreaks of H5N8 were identified. In the 2016/17 reporting year 33 outbreaks were reported and 10,999 birds were culled following the national action plan.

The first ‘Action Plan’ for avian influenza preparedness and control was developed in 2005 with subsequent revisions in 2006, 2012 and 2015. The Action Plan covers (i) preparedness, including detailed guidelines for surveillance while disease is absent, in cases of suspected outbreaks and during an outbreak, (ii) action to be taken in suspect cases, (iii) action in confirmed outbreaks and (iv) improved biosecurity, awareness raising and individual responsibility. The action plan includes a contingency plan for outbreak response. Following outbreak confirmation birds will be culled and compensation is to be paid under ASCAD with central Government contributing 50% and states 50%; the rates are regularly reviewed.

Other diseases

BQ and HS: annual vaccination before the monsoon season.

ND: regular vaccination and serological monitoring of vaccine efficiency by commercial poultry producers

IBR: regular testing in bull stations and semen centres

TB and Johne's disease: testing conducted on commercial dairy farms with 100% funding by central level. The problems of dealing with positive animals are similar to those described for brucellosis (above). A number of TB cases have been found in elephants.

Disease forecasting

NIVEDI operates a web based and GIS supported disease forecasting system which provides warnings two months in advance for 15 economically important diseases[18]. These forecasts are based on information entered into a disease database provided by the 31 sub-centres of NIVEDI, which in turn receive them from the state NADRS nodes, and from a 'Riskfactor database'. The disease warnings are issued for each state. In 2017 this system was released also as a mobile app which allows for the warnings to be viewed at village level and preventative measures to be undertaken. The accuracy of these warnings is monitored by NIVEDI.

Cold Chain

Cold chain is generally in place with fridges and cool boxes widely available. There are very few back-up generators and no use of temperature monitoring of the cold chain. Vaccine was stored in chillers with no alarms, data loggers or simple max-min thermometers. On a number of occasions HS vaccine was found stored below freezing point and also sometimes at ambient temperature as the fridge was not working.

Strengths:

- Chain of command with co-funding mechanism allows DADF to control programme implementation
- Action Plan and clear guidelines on AI for the diagnosis, screening, reporting and actions required following confirmation
- High capacity to implement a disease outbreak response
- Official recognition of the FMD-CP by the OIE
- PPR road map developed and under implementation
- Introduction of an 'all India animal health card' to record vaccinations
- Compensation for AI and glanders

Weaknesses:

General

- Inability to slaughter cattle reduces control options
- Lack of animal identification and identification of infected animals
- Lack of review of disease control programmes – no independent committees or audits
- Little supervision at markets or slaughterhouses
- Over-emphasis on vaccination and sero-surveillance rather than an integrated approach including awareness and biosecurity, outbreak investigation, tracing, movement control and isolation
- Lack of cold chain temperature monitoring at the field level

FMD

- Limited vaccination coverage of stray cattle
- High volume of uncontrolled cattle movement into states where slaughter is permitted
- No compensation scheme for slaughter (where allowed) during FMD outbreaks

PPR

- Insufficient vaccine available in some states
- Post vaccination monitoring not routinely being conducted
- Lack of owner understanding and commitment to the vaccination programme

[18] www.nadres.res.in

Brucellosis

- Inability to remove infected cattle from the population

Glanders

- movement bans apparently ineffective for risk population (working horses)
- Imposed movement bans affect sport horses and cause a lot of complaints

HPAI

- No simulation exercises

Rabies

- Culling dogs is generally not permitted
- Lack of individual stray dog identification limits ease of revaccination and monitoring

Recommendations:

General

- Regularly assess the effectiveness of all disease control programmes using epidemiological analysis of surveillance data and activities undertaken
- Introduce a mandatory requirement that all disease positive animals are permanently identified and these animals are kept in isolation or culled
- Introduce national individual animal identification for all bovines
- Assess the possibility of conducting multiple vaccinations at the same time, in particular FMD and HS
- Purchase max-min thermometers for every vaccine cold room and fridge used for vaccine storage in the field

FMD

- Develop a programme for individual animal identification of bovines
- Implement improved movement control across state borders, particularly those that are considered FMD free with vaccination
- Investigate the reasons for high NSP results

PPR

- Finalise the national PPR Eradication Strategy with reference to the OIE/FAO Global PPR Eradication Program and develop detailed national guidelines

Rabies

- Improve rabies surveillance under the One Health approach through improved coordination with health departments and increased case investigation
- Identify vaccinated stray dogs so that revaccination can be monitored

Glanders

- Allow inter-state movement of sport horses between non-affected glanders states provided they originate from establishments free from glanders for a specified period
- Register horse traders and engage them in disease control efforts
- Improve movement control with health certifications

Brucellosis

- Permanently mark positive animals by branding, ear notching etc. and prohibit their sale

II-8 Food safety **A. Regulation, authorisation and inspection of establishments for production, processing and distribution of food of animal origin** *The authority and capability of the VS to establish and enforce sanitary standards for establishments that produce, process and distribute food of animal origin*	Levels of advancement
	1. Regulation, authorisation and inspection of relevant establishments are generally not undertaken in conformity with international standards.
	2. Regulation, authorisation and inspection of relevant establishments are undertaken in conformity with international standards in some of the major or selected premises (e.g. only at export premises).
	3. Regulation, authorisation and inspection of relevant establishments are undertaken in conformity with international standards in all premises supplying throughout the national market.
	4. Regulation, authorisation and inspection of relevant establishments (and coordination, as required) are undertaken in conformity with international standards for premises supplying the national and local markets.
	5. Regulation, authorisation and inspection of relevant establishments (and coordination, as required) are undertaken in conformity with international standards at all premises (including on-farm establishments).

Terrestrial Code reference(s): Appendix 1

Evidence: Section 6.4 Country Background Information – INDIA, SM15, SG15, SG16, JW21, JW22, JW23, JW24, JW25, JW26, JW27, JW28, JW30, JW39, JW45, JW40, JW45, JW49, JW70, JW73, SKA11, P20JW, P32JW,

Findings:

The Food Safety and Standards Authority of India (FSSAI) referred to as the 'Food Authority', was established under the Food Safety and Standards Act (2006) and is administered by the Ministry of Health and Family Welfare. FSSAI is the Competent Authority mandated to regulate and monitor the manufacture, processing, distribution, sale and import of food. FSSAI is authorised to make regulations concerning:

- Limits on the use of food additives, contaminants, residues of veterinary drugs, heavy metals, mycotoxins and the irradiation of food;
- The mechanisms and guidelines for certification of food safety management systems;
- The procedures and enforcement of quality and safety of food imported into India;
- The procedures and guidelines for the accreditation of food testing laboratories;
- The method of sampling, analysis and information sharing among enforcement authorities;
- The use of risk analysis, assessment, communication and management.

The Act is enforced by the central Food Authority and state Food Safety Authorities, which are responsible for ensuring that food businesses comply with the law and maintain systems of public communication on food safety and risk, food safety surveillance and other monitoring activities for all stages of the food business.

Day to day enforcement of the Act and its regulations are carried out by Food Safety Officers appointed by the FSSAI and can include veterinarians, some of whom are deputed to slaughterhouses as meat inspectors by the state AHDs. Food Safety Officers must hold as a minimum qualification one of the following: 'a degree in Food Technology or Dairy Technology or Biotechnology or Oil Technology or Agricultural Science or Veterinary Sciences or Biochemistry or Microbiology or master's degree in Chemistry or degree in medicine from a recognised University".

Authorisation to construct and operate a milk collection centre, milk processing plant, export abattoir, domestic slaughterhouse, processing facility or small retail business ('meat shop') is complex. The regulations governing the establishment and operation of a food business are found in the Food Safety and Standards (Licensing and Registration) Regulations (2011). Two categories of food processor are recognised by the FSSAI based on annual turnover (see Schedule 1 – Regulations). Large capacity milk and meat processors include dairy units and

milk chilling units equipped to handle or process more than 50,000 litres of liquid milk/day or 2,500 MT of milk sold per annum and all slaughter houses equipped to slaughter more than 50 large animals or 150 or more small animals including sheep and goats or 1,000 or more poultry birds per day as well as meat processing units equipped to handle or process more than 500 kg of meat per day or 150 MT per annum are required to be licensed by the Central Licensing Authority of the FSSAI in Delhi. Small butchers and milk retailers/vendors and milk producers who are not members of a Dairy Union/Cooperative are categorized as 'Petty Food Manufacturer' and include traders who procure or handle/collect and sell up to 500 litres of milk per day or butchers who operate a business with a capacity to slaughter two large animals or ten small animals or 50 poultry birds per day or less must be licensed by the State Licensing Authority of the State Food Authority. In each case an application form must be completed; a list of the supporting documentation required to support each application is given in Annexure 2 to Schedule 2. Amongst the required documents are No Objection Certificates issued by the Pollution Control Board of the MoEFCC and from the Municipality.

The slaughter facility plans must be examined by the FSSAI for compliance with the construction and other detailed standards set down in regulations. Compliance with these rules is enforced by Designated Officers some of whom who may be veterinarians appointed by the Municipality under the authority of the FSSAI. Following approval, a licence to operate a food processing facility is issued by the FSSAI.

The PCA Act, Slaughterhouse Rules, state that 'No person shall slaughter any animal within a municipal area except in a slaughter house recognised by the concerned authority'. Further, a slaughterhouse is defined as being a place where '10 or more animals are slaughtered per day and is duly licensed or recognised under a State or Provincial Act or any rules or regulations made thereunder.'

Smaller businesses which process food are also categorised by the Food Safety and Standards, Licensing and Registration of Food Businesses Regulations in which a 'Petty Food Manufacturer' is defined as someone who sells, processes or handles food including slaughtering not more than two large animals per day, 10 small animals or 50 poultry.

In practice there are many small slaughter facilities and 'meat shops' operating throughout India that do not comply with either the standards of the FSSAI or those of the MoEFCC. For example in Uttar Pradesh it has been estimated that there are approximately 140 unlicensed slaughterhouses and at least 50,000 meat shops are unauthorised. The situation is similar in all states.

The ICAR National Research Centre on Meat (NRCM) is not only the national laboratory for undertaking research in meat technology, it also provides training programmes for clean meat production, meat processing and quality management areas. NRCM is mandated to provide needs-based training for personnel in allied sectors and to establish a liaison with industry, trade, regulatory and development organisations operating in the meat sector.

Capacity building in food safety and meat hygiene is being implemented through a number of training courses including:

- Hygienic practices and fabrication of sheep and goat carcasses;
- Hygienic slaughter of poultry;
- Packaging of meat products;
- Assessment of microbial quality for meat food safety;
- Effective utilisation of slaughter by-products from livestock, poultry and fish;
- Analysis of pesticide residues in animal foods; (5 days)
- Meat quality management, and meat inspection for state Veterinary Officials (5 days).

NRCM have only delivered seven courses to 103 trainees in the past 5 years.

NRCM also produces a number of useful information leaflets on animal management and welfare prior to slaughter, for safe clean meat production and slaughterhouse designs. Not all Food Safety Officers have been given sufficient training to carry out their responsibilities

according to international standards, especially those working in the less densely populated smaller district centres, small towns and villages, where large quantities of meat are slaughtered informally for local sale and consumption.

The Export Inspection Council (EIC) is responsible for the notification of commodities, including poultry meat, which are subject to quality control and or inspection prior to export, establishment of standards for their control and the type of quality control inspection that is required. The EIC either alone, directly at central level, or through Export Control Agencies, locally certifies the quality of food items for export through enforcement of standards defined by food safety management systems such as ISO 22000/2005 and HACCP, issues 'Certificates of Country of Origin' to exporters and licenses, registers and inspects export abattoirs.

Export certification of meat quality and safety falls under the responsibility of the Agricultural and Processed Foods Export Development Agency (APEDA), administered by the Ministry of Commerce and Industry. Veterinarians deputed by state AHDs as meat inspectors on behalf of APEDA do not come under the direct supervision and authority of the Animal Husbandry Commissioner or the state CVOs.

There are 80 export abattoirs registered by APEDA. The major export abattoirs provide good in-house induction and in-service training for all levels of staff involved in enforcement of their HACCP plan and food safety management systems for each cadre of personnel according to their specific responsibilities.

All export abattoirs and the few large modern municipal abattoirs are well managed and employ modern food safety management systems based on HACCP. Many such abattoirs are ISO 9001 accredited and some are in the process of becoming ISO 22000/2005 accredited.

For example, the Allana export facility in Maharashtra, the biggest buffalo meat exporting company in India, with exports to 74 countries, is authorised and licensed by APEDA as the central body to regulate exports; the food safety side is authorised by the FSSA and the facilities are certified by ISO and NABL. The abattoir is regularly inspected by various departments including health, AHD, pollution, road transport, police and revenue.

Below this level of abattoir there are many smaller urban slaughterhouses throughout India, (e.g. 135 just in the state of Tamil Nadu). The quantity of meat which is processed at such premises is small in comparison to that which has been informally slaughtered by the tens of thousands of small butcher's shops which, although some are registered as food businesses most are not being inspected for food safety.

Smaller slaughterhouses are generally in a poor state of repair, lack good maintenance and thus difficult to manage good standards of hygiene. At most smaller slaughterhouses there is a veterinarian deputed from the local authority who undertakes ante- and post mortem inspection. In some of these slaughterhouses good records of ante- and post mortem inspections are being kept; however, the animal disease information in these records is not being used by the AHDs as a source of surveillance information.

Poultry meat available at major restaurant chains and supermarkets is provided by modern slaughter facilities utilising HACCP based food safety management systems. However, the majority of poultry meat consumed in India is sold at small specialised poultry outlets which slaughter birds and prepare carcases, on a one-by-one basis on the premises, often under less than good hygienic conditions.

The consumer demand for fresh meat exceeds the current capacity for supply from well-constructed and well-maintained slaughterhouses, where food safety management systems equivalent to HACCP can be correctly implemented. Little priority is given to the food safety of animal products by municipal and other local authorities, resulting in poor and inadequate slaughter facilities.

There are many dairy cooperatives operating throughout India. Most milk entering the retail market has been processed and pasteurised, reducing the risk of disease transmission. In general, the milk processing plants are being managed to a high standard with many achieving ISO 9001 and some ISO 22000/2005 accreditation. Milk samples are taken routinely for quality testing and sometimes for microbial examination. Very few of the milk processing facilities test bulk milk or milk on delivery at milk collection centres for possible detection of brucellosis and tracing back to the producer. Milk processing plants are regularly inspected by Food Safety Officers working for the local authorities under the authority of the FSSAI.

Strengths:

- Well-constructed and maintained export and large municipal abattoirs with quality assurance programmes
- Food safety and hygiene inspections are regularly carried out at all export and large municipal abattoirs, some smaller slaughter facilities and milk processing premises
- Milk collection and processing being well managed; many milk processing facilities have HACCP systems operating to international standards, with the exception of testing for chemical residues

Weaknesses:

- Overlapping and inconsistencies in rules and regulations
- Large numbers of abattoirs and meat shops operating illegally and not in compliance with FSSAI standards
- Most red meat and poultry has not been processed at a formal licensed slaughter facility where food safety management systems in place
- The infrastructures and facilities at most smaller municipal and district level slaughterhouses need upgrading
- Local authority inspectors require further training in risk-based management of food safety
- Insufficient numbers of veterinarians to undertake ante- and post mortem inspection
- Little or no reporting and use of ante- and post mortem inspection findings

Recommendations:

- FSSAI should more actively promote the food safety of animal products
- AHD and FSSAI should develop better coordination of food safety activities
- Upgrade and construct more slaughter facilities and eliminate local and informal slaughter
- Provide training to inspectors/food safety officers on food safety management systems such as HACCP
- Collect surveillance information from all slaughterhouses, analyse and report back to the veterinary services – state AHDs, DADF and NIVEDI/NADRES

B. Ante and post mortem inspection at abattoirs and associated premises (e.g. meat boning/cutting establishments and rendering plants). *The authority and capability of the VS to implement and manage the inspection of animals destined for slaughter at abattoirs and associated premises, including for assuring meat hygiene and for the collection of information relevant to livestock diseases and zoonoses.*	**Levels of advancement**
	1. Ante- and post mortem inspection and collection of disease information (and coordination, as required) are generally not undertaken in conformity with international standards.
	2. Ante- and post mortem inspection and collection of disease information (and coordination, as required) are undertaken in conformity with international standards only at export premises.
	3. Ante- and post mortem inspection and collection of disease information (and coordination, as required) are undertaken in conformity with international standards for export premises and for major abattoirs producing meat for distribution throughout the national market.
	4. Ante- and post mortem inspection and collection of disease information (and coordination, as required) are undertaken in conformity with international standards for export premises and for all abattoirs producing meat for distribution in the national and local markets.
	5. Ante- and post mortem inspection and collection of disease information (and coordination, as required) are undertaken in conformity with international standards at all premises (including family and on farm slaughtering) and are subject to periodic audit of effectiveness.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SG16, JW21, JW22, JW23, JW25, JW26, JW27, JW28, JW39, JW40, JW45, JW49, JW70, JW73, P5JW, P29JW

Findings:

Ante- and post mortem inspection of animals and carcasses prepared at export abattoirs is conducted by veterinarians employed by the slaughterhouses themselves who are supervised by state veterinarians deputed by the AHD to municipal councils/local authorities working under the authority of the APEDA, in accordance with international standards. A similar arrangement is found in the large municipal slaughterhouses where a state veterinarian deputed by the AHD to work for the municipal authority supervises a team of veterinarians employed by the slaughterhouse. In each case ante- and post mortem inspections are carried out well and in accordance with international standards.

There are no specific regulations either under the FSS Act nor the Prevention of Cruelty to Animals Act defining the procedures for ante- and post mortem inspection including any algorithm for determining action to be taken if any pathology or other abnormality is detected at post mortem inspection. The PCA Act, Slaughterhouse Rules state that 'No animal which… has not been certified by a veterinary doctor that it is in a fit condition to be slaughtered'.

Most meat consumed in India is sold from butcheries which slaughter less than 10 animals per day and thus fall into a category of food business (as defined in the Food Safety and Standards, Licensing and Registration of Food Businesses Regulations), that is required to be registered with the local authorities, and must comply with standards of hygiene etc., but which, in practice cannot be effectively inspected by a veterinarian or a Food Safety Officer on a routine and regular basis as they are far too numerous, given the current staffing levels of municipal or other local authorities.

Some states are actively inspecting the meat markets to prevent the sale of meat which has not been prepared at a licensed premises or which has not been inspected and certified by an authorised inspector.

No information is being provided from the ante- and post mortem inspection of animals and meat to the state AHDs or to DADF, except in the case of export abattoirs.

Strengths:

- Competent Authorities conduct inspections of animals and meat in accordance with international standards at export and municipal slaughterhouses
- Veterinary public health inspectors are detecting and applying sanctions against butchers who attempt to sell uninspected and uncertified meat

Weaknesses:

- Most poultry and red meat consumed is prepared and processed in small butcheries with poor standards of hygiene and food safety
- Limited capture of surveillance information from ante- and post mortem inspections
- Ante- and post mortem inspection at smaller slaughterhouses is not in accordance with international standards
- No regulations defining the procedures for ante- and post mortem meat inspection

Recommendations:

- Upgrade and construct slaughterhouses to meet modern food safety management, based on HACCP
- Improve collection of data on animal diseases detected at ante- and post mortem inspection to support the surveillance programmes
- Introduce regulations on ante- and post mortem meat inspection and specify any actions to be taken on the findings of the inspections

C. Inspection of collection, processing and distribution of products of animal origin *The authority and capability of the VS to implement, manage and coordinate food safety measures on collection, processing and distribution of products of animals, including programmes for the prevention of specific food-borne zoonoses and general food safety programmes.*	Levels of advancement
	1. Implementation, management and coordination (as appropriate) are generally not undertaken in conformity with international standards.
	2. Implementation, management and coordination (as appropriate) are generally undertaken in conformity with international standards only for export purposes.
	3. Implementation, management and coordination (as appropriate) are generally undertaken in conformity with international standards only for export purposes and for products that are distributed throughout the national market.
	4. Implementation, management and coordination (as appropriate) are generally undertaken in conformity with international standards for export purposes and for products that are distributed throughout the national and local markets.
	5. Implementation, management and coordination (as appropriate) are undertaken in full conformity with international standards for products at all levels of distribution (including on-farm establishments).

[Note: This critical competency primarily refers to inspection of processed animal products and raw products other than meat (e.g. milk, honey etc.). It may in some countries be undertaken by an agency other than the VS.]

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SG16, JW20, JW21, JW22, JW23, JW25, JW26, JW27, JW28, JW30, JW33, JW39, JW40, JW45, JW49, JW70, JW73, HP5,

Findings:

The VS has no direct authority or responsibility for collection, processing and distribution of products of animal origin. The Food Safety and Standards Authority of India (FSSAI), under the Ministry of Health and Family Welfare has the authority and is responsible for regulating the safety of all food imported into and domestically produced in India during manufacture, processing and distribution from the point of processing or manufacture to its final destination including retail outlets, hotels or restaurants. The responsibility for enforcement of the Food Safety and Standards Act (2006), rules (2010) and regulations lies with State Food Safety Authorities under the overall supervision of a Food Safety Commissioner, appointed by the state government.

Municipal, district and other local authorities appoint Food Safety Officers who enforce the food safety standards on a day to day basis.

In general, the food standards set by the FSSAI are well enforced in export and large municipal abattoirs and most milk collection centres and milk processing facilities.

However, neither the state Food Standards Authorities nor the veterinary authorities under the AWBI or state AHDs have the capability in terms of numbers of personnel and level of training of personnel to extend the same level of oversight and enforcement of similar standards at all medium sized slaughter facilities and especially at meat shops, from which most of the meat consumed in India is sold.

Almost all major meat and milk processing premises are following a HACCP plan and are being regularly inspected and audited by FSSAI/ISO accreditation authorities.

Distribution of food of animal origin is regulated in cities by Food Safety Officers employed by municipal authorities in most states. However, the widespread informal slaughter of meat makes it impossible to effectively regulate the sale of meat at most retail outlets. Most poultry are sold alive or slaughtered and prepared for sale at retail outlets under less than hygienic conditions. Poultry meat sold on the retail market is derived from poultry which have mostly not undergone formal ante- and post mortem inspection.

Strengths:

- Good standards for food safety and hygiene at food processing premises in existing legislation
- High degree of regulation of animal product value chain at the larger municipal and export slaughterhouses and further processors

Weaknesses:

- Insufficient coordination of regulation and enforcement of standards of food safety at food processing and retail premises
- Poor capacity to enforce food safety standards at small scale domestic markets and other outlets

Recommendations:

- Establish veterinary public health departments at state level and deploy sufficient numbers of veterinarians to conduct ante- and post mortem inspection
- Improve coordination of food safety between MoH&FW and DADF
- Develop joint food safety programmes with Competent Authorities to improve the control of food processing, distribution and retail
- Increase training on risk-based food safety management systems as well as ante- and post mortem inspection

II-9 Veterinary medicines and biologicals *The authority and capability of the VS to regulate veterinary medicines and veterinary biologicals, in order to ensure their responsible and prudent use, i.e. the marketing authorisation, registration, import, manufacture, quality control, export, labelling, advertising, distribution, sale (includes dispensing) and use (includes prescribing) of these products.*	Levels of advancement
	1. The VS cannot regulate veterinary medicines and veterinary biologicals.
	2. The VS have some capability to exercise regulatory and administrative control over veterinary medicines and veterinary biologicals in order to ensure their responsible and prudent use.
	3. The VS exercise regulatory and administrative control for most aspects of the regulation related to the control over veterinary medicines and veterinary biologicals, including prudent use of antimicrobial agents in order to ensure their responsible and prudent use.
	4. The VS exercise comprehensive and effective regulatory and administrative control of veterinary medicines and veterinary biologicals.
	5 The control systems are regularly audited, tested and updated when necessary.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SM16, JPW19, JW20, JPW41, JPW42, JPW29, JPW60, JPW43, SH3, SGU5, SGU6, JPW87, JPW88

Findings:

Veterinary medicines and biologicals are controlled by the Central Drugs Standard Control Organization (CDSCO) under the Directorate General of Health Services of the Ministry of Health and Family Welfare. The CDSCO is headed by the 'Drugs Controller General' of India. The CDSCO is the Central Authority for discharging functions as assigned to the Central Government by the Drugs and Cosmetics Act, 1940 and Rules, 1945. Drug control is under the mandate of the Central Government as stated in the Concurrent List of the Constitution and extends over the whole of India.

The CDSCO controls the import, manufacture and distribution of drugs, cosmetics and medical devices which includes veterinary medicines and biologicals. Its objective is to ensure the safety, efficacy and quality of the drugs. CDSCO is responsible for the approval of new drugs, import licensing, licensing of veterinary medicines, prohibition of drugs, drug testing and amendments to legislation. A 'Drugs Technical Advisory Board' is chaired by Director General Health Services and has the Director, IVRI is the an ex-officio member.

An expert committee is constituted by DADF with the chairman and other experts selected by DADF as per their technical competency; currently the chair is from ICAR. The expert committee advises DADF on veterinary medicines and biologicals and makes recommendations on whether they should be approved or not. DADF has the authority to say no to any drug/vaccine proposal

The Veterinary Division of the CDSCO then can grant 'Marketing Authorisation' for products, including the approval/renewal of Central Licensing Approval Authority (CLAA) products, issuance/renewal of registration certificates and import licenses, approval of field trials, permission for post approval changes and issuance of export and import No Objection Certificate (NOC), coordinates with IVRI (on vaccine testing) and maintains records, provides high level policy support as required including in court cases. CDSCO has an informative website: http://www.cdsco.nic.in/forms/Default.aspx

The Biological Standards Division at IVRI-Bareilly is the veterinary laboratory that has been tasked with assessment of veterinary biologicals including vaccines, antisera, toxoids and diagnostic antigens. The Director of the IVRI is an *ex officio* member of the Drugs Technical Advisory Board. The Biological Standards Division is fully functional but operates from an aged facility at the Bareilly site; it has access to animal testing facilities when required including a BSL-3 biosafety facility.

In 2010, the 'Chaudhary Charan Singh National Institute of Animal Health' (CCSNIAH) at Baghpat, an extensive laboratory facility was established and is designed to provide recommendations on the licensing of veterinary vaccines, to undertake quality control (safety, potency and sterility) and development of standards for veterinary vaccines and diagnostic reagents. CCSNIAH has high level facilities for biosafety (BSL-2 and BSL-3) and with animal testing facilities to provide the regulatory assessment of veterinary biologicals in India; at the time of the mission the BSL-3 facility was not operational. CCSNIAH undertakes testing following the protocols laid down in the Indian Pharmacopeia and as required under the Drugs and Cosmetics Act, 1940. It is intended that this large facility takes over much of the role of the IVRI facility at Bareilly and this is now starting to take place. CCSNIAH is accredited under ISO 9001 and it is expected to become accredited under ISO 17025.

Provisions are laid down for the recall or rapid alert for medicines and biologicals – recalls may be voluntary or statutory and be actioned at the wholesale, retail or individual consumer level. Timelines and templates for the recall are set down in the guidelines. No recalls of veterinary medicines are recorded. Mock recalls are not being undertaken to test the system.

There are a number of large public and private manufacturers producing a wide range of vaccines including FMD, PPR, HS, BQ, enterotoxaemia, anthrax, ND and a full range of other poultry vaccines. Vaccine manufacturers have faced increased control and are required to apply Good Manufacturing Practices (GMP). This has resulted in a reduction and or refocus of which vaccines were being produced and major upgrades to facilities e.g. Institute of Veterinary Biological Products, Pune is commissioning a new complex in 2018. Some facilities remain below standard with no GMP or ISO quality control in place e.g. Veterinary Biologicals Lucknow.

Actions are taken when a drug safety is identified such as the overuse of oxytocin in dairy animals. The Drugs Controller General issued a public notice for comment on the 'Restriction on the import, manufacture, distribution and sale of oxytocin to curb its misuse' in February 2018; it is proposed that the manufacture of oxytocin was to be changed to packaging only in single use blister packs and the drug could be prescription only. This action followed ongoing reports of the illegal import, manufacture and sale of the drug; previously meetings of stakeholders had been held.

In the states the 'State Licensing Authorities', under the State Departments of Health, are responsible for the licensing of manufacturers, pharmacies (points of drug sales), approval of drug testing laboratories, compliance with the legislation and recall of sub-standard drugs.

At the state level drug purchase and distribution is controlled on a state-wide basis with each district requesting the type and quantities of medicines and biologicals it requires considering the requests of their veterinarians and field services. Each state makes a purchase through a tendering system considering the climatic conditions prevalent in the state, the disease patterns expected, the pharmacological properties of the products and feedback from field officers. In some states districts are also allowed to make direct purchases if the state can not meet their needs.

The range and availability of drugs in the districts and local area dispensaries and village clinics was observed as being reasonable but is limited – drugs and vaccines are provided at no cost. Typically, third generation cephalosporins and fluoroquinolones were the first drugs of choice to treat infectious diseases; oxytetracyclines and procaine penicillins were much less commonly available. Alternative medicines are provided through local pharmacies (drug shops) which dispense on receipt of a prescription signed by a veterinary officer; charges are made for the drugs dispensed.

Pharmacies dispensing veterinary medicines are licensed and inspected by state 'Drug Inspectors'. A license to operate is issued for five years following inspection which is repeated every six months. The operators of the pharmacies must be registered pharmacists; they usually also dispense human medicines.

In one veterinary pharmacy the owner (not a pharmacist) had four licences under the Drugs and Cosmetics Act – two for retail and two for wholesale but he did not have a Schedule X licence for narcotics as they were not stocked. These licences are valid for five years and cost 1,500 INR each.

Veterinary para-professionals do not have the authority to administer, dispense or prescribe medicines unless under veterinary supervision. With the high numbers of veterinary para-professionals and the private sector gopal mitras this requirement is under pressure and there are concerns about the validity of the actual veterinary supervision.

The international concerns over the high usage of antimicrobials and the development of resistance globally are recognised. In 2014, DADF issued an 'Advisory Note' that antimicrobials were no longer to be included in animal feed as growth promoters; states have been complying by issuing state regulation. On visits to feed manufacturers no evidence was found of antimicrobials being included in animal feed but it understood that antimicrobials are widely used at high risk times.

Antimicrobial resistance is being identified and a number of projects have been or are being undertaken. One report from IVRI indicated a high prevalence of resistance with 'extended spectrum β-lactamase' (ESBL) in 58% of samples and carbapenemase resistance in more than 25% of samples; these bacterial samples were taken from a mixed population mainly of enterobacteria with some pasteurella and bordetella. More than 60% of pseudomonas, salmonella, staphylococcus and E.coli are resistant to ESBL.

Strengths:

- Veterinary medicines and biologicals are licensed nationally by the CDSCO with advice being provided by an expert veterinary technical committee
- The distribution and use of veterinary medicines and biologicals is only permitted under veterinary supervision
- Pharmacies must be registered to dispense veterinary medicines and are periodically checked by state drug inspectors

Weaknesses:

- Dispensing of veterinary medicines and biologicals is not always under veterinary supervision
- There are unconfirmed rumours of illegal and informal access to and use of veterinary medicines and biologicals
- State drug inspectors undertake checks but no formal audit plan is in place
- Recalls of veterinary medicines are not recorded and mock recalls to test the system are not carried out

Recommendations:

- Ensure that the dispensing of veterinary medicines and biologicals is always under veterinary supervision
- Review information on the illegal and informal use of veterinary medicines and biologicals – undertake a risk analysis to focus this activity
- Develop and implement a formal audit plan for state pharmacies and veterinary hospitals and clinics
- Ensure recalls of veterinary medicines are recorded and carry out simulation exercises on recalls to test the system

II-10 Residue testing	Levels of advancement
The capability of the VS to undertake residue testing programmes for veterinary medicines (e.g. antimicrobials and hormones), chemicals, pesticides, radionuclides, metals, etc.	1. No residue testing programme for animal products exists in the country.
	2. Some residue testing programme is performed but only for selected animal products for export.
	3. A comprehensive residue testing programme is performed for all animal products for export and some for domestic consumption.
	4. A comprehensive residue testing programme is performed for all animal products for export and domestic consumption.
	5. The residue testing programme is subject to routine quality assurance and regular evaluation.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SM16, JPW19, JPW44, JPW82, JPW83, SG15, P18JW.

Findings:

Residue testing of food of animal origin for domestic consumption is managed by FSSAI. DADF have no residue testing or monitoring programmes. Pilot programmes are being undertaken by ICAR-IVRI in coordination with ICMR.

FSSAI, is the national competent authority, and has a programme for the residue testing of animal products. Each state has 'Food Commissioners' responsible for the implementation of FSSAI programmes and standards in the state with visits and monitoring activities being handled by 'Food Safety Officers'.

FSSAI follows the principles as set out by Codex Alimentarius and runs training courses on their standards.

Laboratories and test methodologies have been defined and staff training provided. Maximum Residue Limits (MRLs) have been established for a wide range of priority residues including heavy metals, aflatoxins, pesticides (organochlorines, organophosporus, pyrethroids etc) herbicides, antimicrobials and other veterinary pharmaceuticals and melamine. Products covered include milk, meat and honey.

There is only a very limited programme for the testing of residues in animal products. An FSSAI programme for residue testing in milk including screening, identification of 'hotspots' and the development of a framework for ongoing monitoring was put out to tender in October 2017; this pilot programme is now underway. A further focus is to be on broiler meat and this programme is said to be going to start in mid-2018.

New information on residues is being generated by a number of research projects being undertaken by several veterinary universities and colleges and other institutions that are developing their capacity to measure levels of veterinary drug, pesticide/insecticide residues and toxins as well as other important contaminants in food.

There is a need for greater collaboration between the academic institutions, central government and state food regulatory authorities to collect and utilise the findings of all the available research to prepare baseline information on the national prevalence of residue contamination of foods of animal origin.

FSSAI have a system of approved laboratories for food testing; 167 of their 500 laboratories are accredited by NABL.

Some milk producers/processors met by the mission were unaware of the residue testing programme and currently had no programmes in place; others had infrequent programmes testing for pesticides and residues.

Little or no information is being exchanged between FSSAI and DADF on residues detected at national or state levels.

Exporters have residue testing programmes that meet international standards e.g. for buffalo meat and dairy products. Residues tested include pesticides, heavy metals, hormones and antimicrobial agents. Test capabilities are sufficient with good access to HPLC, LC-MS/MS, etc.

In one laboratory visited in Kerala trial residue sampling and testing was being undertaken mainly for export. However, although positive samples had been identified no further action was taken.

The Export Inspection Council (EIC), under its mandate from the Export (Quality Control and Inspection) Act 1963, has 'Residue Monitoring Plans' for the export of products such as meat, eggs and dairy. The plans provide for the detection of illegal substances in the production of food and the compliance with the MRLs for veterinary drugs and other pharmacologically active substances. Samples taken include muscle, blood, skin with fat, organs, feed, raw milk, honey, water etc. and these are taken from dairy farms, layer farms, broiler farms, slaughter houses and processors.

The laboratories undertaking residue testing for exports are assessed by importing countries.

Strengths:

- FSSAI have the mandate to undertake residue testing
- Exporters comply with EIC requirements on residue testing
- FSSAI has a network of approved laboratories
- Useful baseline information on prevalence of residues from pilot research projects

Weaknesses:

- No communication between FSSAI and the veterinary and animal husbandry departments at national or state level
- No risk analysis being undertaken on priority products
- In trials, action was not being taken following detection of positives

Recommendations:

- Establish coordinating committees between FSSAI and the veterinary and animal husbandry departments at national and state levels
- Use risk analysis to identify priority products and residues to be tested
- FSSAI to implement further pilot programmes and share information on findings with DADF and state livestock departments
- DADF and state livestock departments implement an information, extension and communications programme as required
- Initiate control actions where positive tests are found, including during trials
- Mandate the collection and testing of samples to verify compliance with standards set by FSSAI

II-11 Animal feed safety	Levels of advancement
The authority and capability of the VS to regulate animal feed safety e.g. processing, handling, storage, distribution and use of both commercial and on-farm produced animal feed and feed ingredients.	1. The VS cannot regulate animal feed safety.
	2. The VS have some capability to exercise regulatory and administrative control over animal feed safety
	3. The VS exercise regulatory and administrative control for most aspects of animal feed safety
	4. The VS exercise comprehensive and effective regulatory and administrative control of animal feed safety.
	5. The control systems are regularly audited, tested and updated when necessary.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SG48, HLB6, JW55

Findings:

The Indian feed industry is mainly limited to dairy and poultry feed manufacturing. The quality standards of Indian feeds are generally considered high and up to international levels. Much of the feed industry has modern computerised plants and the latest equipment for analytical procedures and employs the latest manufacturing technology.

Currently there is no legislation requiring the registration of feed mills in India. There are large numbers of small feed mills and many larger feed mills in the country. Feed mills, as manufacturing plants, are required to go through the normal planning process including land use, environmental impact and access to power and water. Some states advised of their intention to register feed mills in the near future.

Culturally cattle are considered obligate vegetarians and so no animal proteins or other animal by-products are included in their feed supplements.

Blood and bone meal can be fed to poultry and fish. Protein supplements for cattle are generally derived from soya and from residual grains following oil extraction. Fishmeal and meat-meal were used in poultry feed, but the increased production, improved availability and better awareness of soya bean meal has led to it replacing fishmeal and meat-meal in most poultry rations.

As India is recognised by OIE as ‘negligible BSE risk status’, MBM is being exported for poultry feeding in other countries following rendering.

Feeds are routinely tested for aflatoxins but not for heavy metals, pesticides or salmonellae.

The Compound Livestock Feed Manufacturers Association (CLFMA) has more than 600 members covering all sectors of the livestock industry – feed mills and associates. CLFMA is recognised by livestock farmers, central and state governments, agricultural universities, veterinary colleges and national research institutes in the country and also by related sectors internationally. CLFMA’s objective is to promote animal productivity by improving husbandry and nutrition; it has no direct engagement with animal health. Membership can be cancelled if the company violates the CLFMA standards and transparency.

The Bureau of Indian Standards, a central government organisation, sets standards for feed quality including microbiological and residue testing (heavy metals and dioxins); the standards commonly use European or US standards as benchmarks. The larger feed companies have formal quality control programmes.

In 2014 DADF issued an ‘advisory note’ requesting states to stop using antimicrobial compounds as growth promoters.

Products are generally well labelled but traceability is variable with bags of feed are sometimes being produced and distributed without batch numbers and production dates. Distribution of feed is almost entirely in bags.

Strengths:

- Identified stakeholders as larger feed mills are members of CLFMA
- No animal proteins are fed to cattle as it is culturally unacceptable

Weaknesses:

- No legislation covering feed mills
- No registration of feed mills
- No stakeholder engagement on the need for feed safety

Recommendations:

- Work with the industry to develop legislation or regulations for the national registration of all feed mills
- Register all feed mills – starting with the larger national, wide area suppliers and progressing to the smaller local feed mills
- Develop a quality assurance programme, using risk analysis to prioritise activities, with the feed mills to promote improved animal feed safety

II-12A. Identification and traceability **Animal identification and movement control** *The authority and capability of the VS, normally in coordination with producers and other interested parties, to identify animals under their mandate and trace their history, location and distribution for the purpose of animal disease control, food safety, or trade or any other legal requirements under the VS/OIE mandate.*	Levels of advancement
	1. The VS do not have the authority or the capability to identify animals or control their movements.
	2. The VS can identify some animals and control some movements, using traditional methods and/or actions designed and implemented to deal with a specific problem (e.g. to prevent robbery).
	3. The VS implement procedures for animal identification and movement control for specific animal subpopulations as required for disease control, in accordance with relevant international standards.
	4. The VS implement all relevant animal identification and movement control procedures, in accordance with relevant international standards.
	5. The VS carry out periodic audits of the effectiveness of their identification and movement control systems.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): HB1, HLB7, HLB18, HUP8, HLB9, SM10, SM15, JPW26, JPW27, JPW57, SGU3, SGU4, SGU10, SK15, SKA19, SP2, PHLB5, PHLB12, PHLB17, and PHLB22, P19JW, P46JW.

Findings:

The Prevention of Cruelty to Animals, Registration of Cattle Premises Rules states the obligation for farmers to register their farm when they have more than five cattle and or horses with the 'registering authority'; this means the veterinary department of the state or of a local authority who issue a certificate of registration for three years. This only applies to cities or towns, which have a population of over 100,000. This registration system is not being implemented.

There is also the Prevention of Cruelty to Animals, Regulation of Livestock Markets Rules, which governs regular local animal markets including the requirement for Animal Health Cards. These rules are detailed and cover licencing, structures, and operations including veterinary inspections but limited only to bovines and camels. Some states have their own legislation concerning annual fairs e.g. in Rajasthan there are ten state and livestock fairs held annually for cattle; for the 10-12 mainly goat markets held every week, there is no legislation. Bovines typically arrive without their vaccination record cards and without any fitness to travel certificate.

The NDDB controls the ear tag numbering system for all Indian states. It also has a database, the Information Network for Animal Productivity and Health (INAPH), containing all the numbers issued and keeps detailed records of breeding and production bovines as its emphasis is on improving breeding and productivity and not disease control. Requests are received from district animal health offices for a quantity of ID numbers. The approved tags are yellow plastic with a 12-digit number with the last digit being a check code (that is a code that checks for transcription errors). They are serially numbered and NDDB try to give states serially numbered batches. Only one ear tag is used per bovine. There are a number of companies producing ear tags and though there is no specific standard is laid down in the tender documentation.

INAPH captures data on animal registration, artificial insemination, pregnancy diagnosis, calving, milk recording, body measurement and animal movements. The animal health module captures information on vaccinations, de-worming, disease testing, treatment, outbreak management and fertility management. At present, INAPH has over 30,000,000 breeding and production animals from 12,000,000 farmers – approximately 15% of the population.

There are also herd books used by pedigree breeders but their animals are not necessarily ear tagged using the national format but are often identified by owner tags and other markings such as cold branding.

The Transport of Animals Rules of the Ministry of Environment and Forests and Climate Change requires cattle, sheep, goats, pigs and equines to have a fitness to travel certificate. The model veterinary certificate concerns fitness to travel, vaccinations and the animal ID, if present. Animals arriving at most slaughterhouses generally had a fitness to travel veterinary certificate and their individual animal health vaccination record card. The block veterinarian may sometimes attend the market to supply a fitness to travel document.

There are no requirements for other species (apart from certain equines where the usual horse passport is required) to be individually identified. Identification may be done for specific purposes e.g. for high quality breeding programmes. The Turf Club has issued an SOP on the movement of thoroughbred horses requiring identification.

Some states have set up an owners/farm registration and animal identification system. In Kerala it is estimated that 800,000 households out of 1,000,000 are registered and mapped. The system also includes detailed information on each household with details of numbers and species of animals including their vaccination history. The system also records cattle ear tag ID numbers with about 90% of all bovines now identified. Kerala imports 80% of its cattle needs and this movement presents an FMD disease challenge; it is said that lorries carrying bovines are checked and the movement document and health cards are checked but there are many unauthorised introductions.

In Himachal Pradesh animals are to be tattooed and registered but there is little compliance. Under the national insurance scheme for cattle an ear tag is given but the tag numbering is different to the NDDB system. The national approved ear tags are little used so far as this state was only recently added to the FMD-CP. In other states (e.g. Rajasthan, Uttarakhand, Himachal Pradesh etc.) ear tags were not in widespread use due partly to farmer resistance and the concentration on identifying milking and insured animals. Production animals of commercial/cooperative farms and cattle in gaushalas were generally being tagged. Some states are now requiring that the NDDB ear tag must be used for insurance purposes as well.

New standardised animal health cards (3 cards, one for buffalo, one for indigenous cattle and the other for ‘exotic’ cattle) are now being introduced in all states. These contain more information including owner name and address, details of all vaccinations and treatments given as well as the animal ID number. An important challenge is that when a bovine is sold/moved the animal health card must be passed to the new owner and the card annotated accordingly with the name and address of the new owner otherwise vaccination and treatment history may be lost. There is no provision on the new cards to allow for such a change of ownership.

In Kerala 3,500 tablet computers have been purchased for all veterinary personnel in the field to allow for data capture to input directly into the system described above. In addition, tablet computers have been purchased for the 2018 livestock census. The provision of tablet computers will allow for more timely and effective animal identification and traceability.

There is no effective movement control of livestock. Some states have a number of state border posts on the main roads at their state boundaries, set up at the time of the rinderpest control programme. These state border posts are barely operational with no/few staff assigned, little awareness amongst livestock owners and traders of the need to stop; in addition, the state border posts are only on main roads so the small roads are unmanaged.

Strengths:

- One state has introduced an owner registration and animal ID system with GIS mapping capabilities and some states are using or introducing tablet computers for data entry
- There are good databases (e.g. INAPH) for recording of information including ear tags
- New individual bovine animal health cards being introduced
- Plastic ear tags with 12 digit number and barcode being introduced to all states

Weaknesses:

- No central overall farm registration and animal ID system
- Registration of holdings is only required for five or more bovines and/or horses
- Lack of routine movement controls; fitness to travel certificates not issued for all movements
- Inadequate control of animal movement between states and limited veterinary supervision at markets
- Only one ear tag is used per animal
- Little recognition that animal identification is a prerequisite of effective disease control and is also required under the FMD-CP
- Lack of legislation/awareness by owners to ear tag animals, on animal health cards and over the use of cold branding.
- No compliance with legislation at livestock markets
- There is some confusion over the legality use of cold branding

Recommendations:

- Review and improve the current farm registration and animal ID systems
- Introduce legislation to require ear tagging of all bovines and the procedures for the animal health card
- Strengthen the animal movement controls between states
- Consider introducing a requirement for a fitness to travel certificate for all movements of livestock and require animal owners to keep records of movements onto and off farms
- Implement the market rules to control markets and fairs for animal health, disease control and animal welfare purposes
- Review the use of cold branding and its legality

B. Identification and traceability of products of animal origin *The authority and capability of the VS, normally in coordination with producers and other interested parties, to identify and trace products of animal origin for the purpose of food safety, animal health or trade.*	Levels of advancement
	1. The VS do not have the authority or the capability to identify or trace products of animal origin.
	2. The VS can identify and trace some products of animal origin to deal with a specific problem (e.g. products originating from farms affected by a disease outbreak).
	3. The VS have implemented procedures to identify and trace some products of animal origin for food safety, animal health and trade purposes, in accordance with relevant international standards.
	4. The VS have implemented national programmes enabling them the identification and tracing of all products of animal origin, in accordance with relevant international standards.
	5. The VS periodically audit the effectiveness of their identification and traceability procedures.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): JW70, JW71, JW72, JPW20, JPW21, JPW64, JPW65, HP5, P5JW, P45JW.

Findings:

In export slaughterhouses there is compliance with the need for animal products to be traceable, as required by some importing trading partners. The VS require that animals presented for slaughter at the export abattoirs are accompanied by their Animal Health Card; some export slaughter animals have a paint mark, applied by the trader or buyer, which identifies the animal's origin; this is an informal approach and not defined by government.

Export and the larger municipal abattoirs apply a number to each individual animal when it is subjected to ante-mortem inspection; carcasses and organs are identified using a common numbering system using temporary paper labels up to the point of inspection and certification.

At smaller slaughter facilities there is no traceability of animals/products presented for slaughter nor labelling of carcases or organs inspected by authorised veterinarians.

At larger milk cooperative processing premises, samples are usually taken from the milk cans (churns) delivered to milk collection centres/bulk milk chilling centres for quality testing and may be retained to allow for traceback in the event that milk quality is compromised.

There is no traceability system in place for the trade in poultry and poultry products, with the exception that a few modern poultry slaughterhouses have been established where there is some traceability through identification of batches of birds presented for slaughter.

Strengths:

- Linkage of organs and carcasses is well established at all export abattoirs and most large municipal abattoirs, but through chain traceability is not established

Weaknesses:

- No traceability of animals/animal products at smaller slaughterhouses or at meat shops
- No/little traceability of poultry/poultry products

Recommendations:

- Introduce animal identification to support through chain traceability along the food chain
- Promote the need for traceability of animal products as a means of detecting issues of AMR and drug use/residues

II-13 Animal welfare *The authority and capability of the VS to implement the animal welfare standards of the OIE as published in the Terrestrial Code.*	Levels of advancement
	1. There is no national legislation on animal welfare
	2. There is national animal welfare legislation for some sectors
	3. In conformity with OIE standards animal welfare is implemented for some sectors (e.g. for the export sector)
	4. Animal welfare is implemented in conformity with all relevant OIE standards.
	5. Animal welfare is implemented in conformity with all relevant OIE standards and programmes are subjected to regular audits.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): HB1-5, HLB8, HLB9, SK12, SK13, SG6, SG7, SG10, SG16, SG14, SG21, SGU2, SGU3, SGU6, SGU7, SGU11, SGU12, SRA1, SRA6, SRA7, JPW3, JPW14, JPW32, JPW40, JPW41, JPW63, JPW75, PHLB1, PHLB2, PHLB7, PHLB8, PHLB9, PHLB13, PHLB14, PHLB16.

Findings:

Animal welfare is the responsibility of the Ministry of Environment, Forestry and Climate Change (MoEFCC). The Prevention of Cruelty to Animals (PCA) Act (1960) and its subsidiary regulations provides the legal mandate for animal welfare in India.

The PCA Act (1960) is intended to prevent the infliction of unnecessary pain or suffering of animals. It extends over the whole of India except the State of Jammu and Kashmir. Besides declaring certain types of cruelty to animals as offences with penalties and for establishment of the Animal Welfare Board of India (AWBI) it contains provisions to control experimentation on animals and for licensing and regulating performing animals.

AWBI was established in 1962, the first of its kind anywhere in the world. AWBI is a statutory advisory body on animal welfare legislation and promotes animal welfare by ensuring that animal welfare laws in the country are followed, providing grants to animal welfare organisations and advising the Government of India on animal welfare issues[19]. There is currently one veterinarian sitting on the AWBI; the AHC is a member of a technical committee which advises the Board.

Considerable legislation is under review and development including the Animal Welfare Bill and draft State Animal Welfare Board Rules, Case Property Animals Rules and Pet Shop Rules. Also under review by MoEFCC are Dog Breeding Rules, Livestock Rules and Aquarium and Fish Breeding Rules.

Due to the efforts of the AWBI around 35 state animal welfare boards and 196 SPCAs have been constituted in India. More than 256 cruelty complaints were addressed by the AWBI in the year 2016/17. No figures for non-compliances and prosecutions in the whole of India were made available.

The AWBI has a number of schemes that provide financial assistance for the care of dry/diseased/old/stray animals at gaushalas, the care of rescued cattle, construction of shelter houses, dispensaries, etc., provision of animal ambulances, Animal Birth Control (ABC) programmes for dog control and rabies vaccination.

In addition, special projects have supported a pilot of the National Rabies Control Programme (NRCP) with stray dog birth control and anti-rabies vaccination of stray dogs in pilot areas; the NRCP is now being implemented throughout the country. The Board has facilitated sterilisation and vaccination of 7,261 street dogs under the ABC programme throughout the country in 2016/17. From 2004-2016, the Board has supported the construction of 379 animal shelters and the purchase of 412 ambulances.

[19] https://awbi.org

The AWBI chairman addresses the horse racing stipendiary stewards and the senior veterinary officers of the six Turf Clubs every year on the enforcement of banned substances.

During 2016-7 there were 1,317 applications for Performing Animals under the 'Rules for Pre-shoot Permission Registration' (that is for animals used in filming) were processed by the Board together with some 1,471 applications processed for "No Objection Certificates (NOC) for Performing Animals". In addition 52 performing animals sub-committee meetings have been held for deciding Pre-Shoot Permission' and NOCs. In addition, 38 circuses were under regular monitoring for the humane treatment of animals. Some states, e.g. Madhya Pradesh, have banned performances by wild animals (tigers, bears, etc.)

The Board recognises a number of challenges including the lack of sensitivity of civic bodies when dealing with stray animals, inadequate enforcement of animal welfare, the need to enlarge membership of the Board to all states to facilitate animal welfare initiatives and the need for more stringent animal protection legislation. Urgent matters identified were the need for active state animal welfare boards and district Society for the Protection of Cruelty to Animals (SPCAs), finalisation of draft legislation, development of strict rules for the import of exotic birds and animals and the amendment of administrative rules of the Board.

Transport

New standards for buffalo transport have been adopted following their development by the private sector. The new standards include specially designed trucks, maximum travel times of six hours with offloading and feeding/watering if any longer. Space allowances for the transport of cattle, equines, pigs, sheep and goats have been amended and a 'transport certificate' is required.

Horses

The Brooke is an international NGO founded by Dorothy Brooke in 1934 in Egypt with is HQ in London. In India its official title is the Brooke India with an operating name of Brooke hospital for animals (India) registered as limited company and is recognised by the AWBI as a charity.

Brooke India aims to improve the welfare of working horses, donkeys and mules through alleviating suffering and developing equine welfare practises and facilities to prevent and reduce suffering. It has 45 equine welfare units across 10 states reaching out to some 360,000 equines. Brooke collaborate closely with AHDs and other NGOs to increase the wellbeing of working equines, guided by the OIE standards. Brooke is preparing a welfare code based on the OIE codes and will submit to the Government for approval. Brooke was responsible for increasing the compensation of equines culled because of glanders from 80 to 25,000 INR. It also runs an insurance scheme for equines.

Disease incidence (tetanus, colic, strangles, surra, lameness, wounds) in equines has been reduced and owners understand the importance of taking their animals to the government clinics and to abandon local treatment methods such as firing. It was noted that 60% of working horses are used in the brick producing industry. Brooke provides training for veterinarians, veterinary para-professionals, and farriers, extension work on fodder production and first aid. It also organises welfare assessments in many areas, e.g. Meerut, Mathura and Muzaffarnagar where eleven factors such as immature age for working, hobble lesions, spinal contact etc., were compared between 2015 and 2017 indicating decreased problems over time.

SPCA

SPCAs are present throughout India with activities monitoring animal welfare and animal management and well-being as per the PCA and the Prevention and Control of Contagious and Infectious Diseases Acts. SPCAs employ veterinarians to undertake this work. They also have extensive SOPs for their procedures for interventions and prosecutions.

In the Delhi SPCA, there is a 24 hour help line and they may receive as many as 50 calls per day.

Their premises can hold 1,000 animals which have been seized due to transport and other infringements. Cattle are ear tagged; sheep and goats are marked using colour mark or wool clips.

There are some 15 registered animal welfare NGOs in India who receive funding from central government. There is also a Federation of Indian Animal Protection Organisations (FIAPO), which brings together animal protection groups and has the goal of encouraging a more unified voice for animal welfare. Training workshops and support systems are provided to fill the knowledge gaps within organisations. FIAPO provides guidance to local animal welfare groups on raising awareness and educating people on the consumption of animal products, and the improvement of the conditions for farm animals.

To support emergency response and animal care a number of states have set up 'Emergency Response Centres'. These are call centres which assess the nature and urgency of the call, using trained staff with veterinary supervision to refer callers to nearby veterinary dispensaries and ambulances. These are public private partnerships and are supported by the commitment to corporate social responsibility. Other states are also implementing this approach and the system may eventually be extended across the whole country. This veterinary service has been implemented in a number of states since 2017 (e.g. Gujarat, Telangana, Madhya Pradesh) and is a totally free service. The call centres are large multi-tasking operations that operate 24 hours a day. In Gujarat there are currently 11 veterinary ambulances at their disposal covering seven districts; it is expected that the whole state will be covered by August 2018. All species and all problems are covered including road accidents reports and welfare reports, cruelty, neglect and strays, etc. The response times are rapid with a large digital display informing whole centre of call status, response times etc. Follow-up of cases routinely occurred as well. It is an extremely well run and efficient system.

State run animal hospitals, clinics, mobile clinics provide routine veterinary clinical services as well as emergency work which supports good animal welfare. This is carried out at little or no cost to the animal owners depending on the state.

Gaushalas and animal shelters

Gaushalas are present throughout much of India – except for some states where slaughter of cattle is allowed. They are part funded by the states with money from central government and with additional support from other sources and donations. The gaushalas are holding facilities, often quite large, where cattle are taken at the end of their production life or if diseased, e.g. brucella or TB positive or are strays to live out the rest of their days. Some gaushalas are completely private and rely solely on donations, others are run by municipalities who mainly house stray cattle and in particular stray bulls.

There is a huge need for gaushalas for all the unwanted bulls, unproductive and stray cattle throughout most of the states of India. This is a very significant use of resources including land. More gaushalas are needed to improve disease control and for the likely expansion of numbers due to the drive to increase milk production. It is hoped that due to the proposed introduction of sexed semen numbers of stray bulls can become more manageable.

There are estimated to be many thousands of gaushalas in India housing an unknown number of cattle. There is a major investment in gaushalas. Gaushalas vary in size but many hold 100s or 1,000s of cattle; one gaushala in Delhi houses 7,500 cattle and in Haryana there are 408 Gaushalas holding some 600,000 animals. In Rajasthan one gaushala had 540 blind cattle, 150 disabled cattle, some with part of limbs missing which were going to be given a prosthesis. Cattle in gaushalas are generally ear tagged and are regularly vaccinated against FMD.

In Rajasthan there are 2,319 gaushalas of which 1,724 are registered under the Rajasthan Gaushala Act and the rest are registered under the Rajasthan Society Registration Act. There is a specific department within the AHD, 'Gopalan', that handles the gaushalas.

As slaughtering of camels is also banned in this state there are two camel gaushalas in Rajasthan and private individuals may also offer to keep unwanted ones.

This is because this state has about 80% of the camel population in India and it was considered necessary to ban the slaughter to protect the numbers and preserve the genetic pool. Municipalities have facilities for stray animals; if an owner claims a stray animal a fine is usually payable.

Legislation

Hot branding has been banned for many years (at least since 1984); cold branding is still being carried out on some Marwari horses and some cattle at state breeding farms. Note that under the PCA Act, Regulations of Livestock Markets Rules the marking of animals at markets by hot and cold branding is prohibited.

The detailed rules for experimentation on animals were first enacted by the Ministry of Agriculture in 1968 and were implemented by a Committee set up in pursuance of Section 15(1) of the PCA Act (1960). However, the Committee was later wound up in 1977. After a hiatus of 13 years, a recommendation to reconstitute was agreed.

Following the recommendation of the AWBI, the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) was established by the MoEFCC in 1996 with 15 Members and one Member Secretary. There are 1,687 establishments registered by the Committee for experimental work on animals. The list and further information is publicly available[20].

The PCA Registration of Cattle Premises Rules requires farmers to register their farm when they have more than five cattle and or horses and also requires any premises with milking cattle to display prominently a copy of section 12 in relation to prohibition of injurious actions to the udder to improve milk yield ('Phooka' or 'Doom Dev') but there was no evidence that this requirement was being implemented.

The PCA Regulations of Livestock Markets Rules regulates animal markets and curbs trans-border smuggling of cattle. A notification on this subject stated that no one could bring cattle to an animal market unless a written declaration was made that cattle would not be sold for slaughter. It seems that this has now been suspended by a ruling of the supreme court.

There is an on-going court case on the permitted size of battery cages for layers brought by an NGO. At present cage sizes are 450cm^2 and the proposal is for 550cm^2, though the NGO wants either no cages or uneconomic large size cages. A new Animal Welfare Bill, drafted in 2014, is in process which will include minimum cage sizes. The Poultry Association are concerned about crate sizes for transport of broilers for slaughter being unnecessarily large (same size as for layers which are larger birds); there are also concerns about temperature limits for transporting broilers.

PCA Slaughterhouse Rules and Food Safety and Standards, Licensing and Registration of Food Businesses Regulations provide detailed standards for hygiene and welfare requirements. The Rule defines a slaughterhouse as where ten or more animals, not poultry, are slaughtered per day. It also forbids the slaughter of any animal within a municipal area except in a slaughterhouse recognised/licensed by the concerned authority. There is no requirement for humane slaughter of animals although there is reference to ritual slaughter. There are estimated to be about 22,069 unregistered and unlicensed slaughterhouses in India.

Cattle slaughter is generally not permitted but varies state by state – ranging from no slaughter at all (most states), to slaughter of unproductive, old or sick animals (e.g. Karnataka) to permission to slaughter any type of cattle (e.g. Kerala and the north eastern States) and to illegal slaughter.

No details for stunning methods are specified; various forms of slaughter/stunning were noted. Ritual slaughter (halal) with and without stunning is practiced mainly for export purposes.

[20] http://cpcsea.nic.in/Auth/index.aspx

In one state slaughterhouse ritual slaughter was not allowed. Under the PCA Act it is not an offence to kill an animal in a manner prescribed by religion of any community.

Under the PCA Act euthanasia of animals suffering from a scheduled contagious disease is permitted to prevent disease spread or protect public health. Euthanasia is also permitted to avoid unnecessary pain or suffering but this was not being used in any of the gaushalas visited.

The Wildlife Protection Act (1972) contains some requirements on animal welfare, e.g. prohibiting the public teasing of zoo animals.

Strengths:

- Good legislation available with programme of updating legislation and standards
- Effective AWBI and state animal welfare boards
- Strong NGO programmes and support
- Animal welfare is well funded with considerable free/low cost care of animals being provided
- Cattle in gaushalas are well cared for
- CPCSEA ensures the welfare of animals used in experiments

Weaknesses:

- Lack of direct VS responsibility for animal welfare, as this responsibility is under MoEFCC
- Limited membership of AWBI with some states not represented
- Inadequate enforcement of animal welfare legislation
- Gaps in legislation and limited guidelines available
- Variable support of animal welfare by states, and variable functioning of state welfare boards; limited sensitivity when dealing with stray animals
- Gaushalas can result in unnecessary pain and suffering to cattle and can be reservoirs of disease
- Overcrowding of birds in transport cages (spent layers in particular) and poor welfare of birds in cages sold locally (lack of water and not in shade)
- Lack of extension of PCA Act to the State of Jammu and Kashmir.

Recommendations:

- Create a welfare unit with a nominated welfare veterinary officer in DADF; develop a formal MoU with MoEFCC
- Review AWBI membership and gain better state representation
- Increase awareness and compliance activities; generate reports on activities
- Update legislation
- Review the options for improving the management of diseased, emaciated or suffering cattle
- Draw the attention of states to the Prevention and Control of Infectious and Contagious Diseases in Animals Act (2009) paragraph 25 includes the possibility to euthanase infected animals including cattle
- Review the support needed in each state to ensure more consistent implementation and compliance with the legislation
- Introduce audits/evaluations to monitor the implementation of welfare
- Introduce detailed rules regarding the humane slaughter/stunning of animals
- Review the slaughter of animals outside recognised slaughterhouses and ensure improvement of humane slaughter of animals at these points.
- Review the local poultry selling procedures and improve welfare at point of sale
- Extend PCA Act to the State of Jammu and Kashmir

III.3 Fundamental component III: Interaction with interested parties

This component of the evaluation concerns the capability of the VS to collaborate with and involve stakeholders in the implementation of programmes and activities. It comprises seven critical competencies

Critical competencies:

Section III-1	**Communication**
Section III-2	**Consultation with interested parties**
Section III-3	**Official representation**
Section III-4	**Accreditation / Authorisation / Delegation**
Section III-5	**Veterinary Statutory Body (VSB)**
	A. VSB authority
	B. VSB capacity
Section III-6	**Participation of producers and other interested parties in joint programmes**

Terrestrial Code References:

Points 6, 7, 9 and 13 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General organisation / Procedures and standards / Communication.

Point 9 of Article 3.2.1. on General considerations.

Points 2 and 7 of Article 3.2.3. on Evaluation criteria for the organisational structure of the Veterinary Services.

Sub-point b) of Point 2 of Article 3.2.6. on Administrative resources: Communications.

Article 3.2.11. on Participation on OIE activities.

Article 3.2.12. on Evaluation of the veterinary statutory body.

Points 4, 7 and Sub-point g) of Point 9 of Article 3.2.14. on Administration details / Animal health and veterinary public health controls / Sources of independent scientific expertise.

Chapter 3.3. on Communication.

III-1 Communication	Levels of advancement
The capability of the VS to keep interested parties informed, in a transparent, effective and timely manner, of VS activities and programmes, and of developments in animal health and food safety. This competency includes collaboration with relevant authorities, including other ministries and Competent Authorities, national agencies and decentralised institutions that share authority or have mutual interest in relevant areas	1. The VS have no mechanism in place to inform interested parties of VS activities and programmes.
	2. The VS have informal communication mechanisms.
	3. The VS maintain an official contact point for communication but it is not always up-to-date in providing information.
	4. The VS contact point for communication provides up-to-date information, accessible via the Internet and other appropriate channels, on activities and programmes.
	5. The VS have a well-developed communication plan, and actively and regularly circulate information to interested parties.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SG 31, JPW31, SM5, SUP3.

Findings:

The Ministry of Agriculture and Farmers Welfare has a 'Press Information Bureau' which caters for all departments. The Minister also communicates regularly via videoconference with the State Ministers.

DADF has funding for communication through different budget lines, depending on the nature of the communication messages being provided.

A 'IEC' (Information, Education, Communication) component forms part of every central programme (e.g. PPR-CP, FMD-CP). Initially the focus is on informing DADF staff of the objectives of the programme, then the training of veterinarians (and veterinary para-professionals if needed) and then communication and extension to the beneficiaries.

Similarly, the National Livestock Mission (NLM), started in 2014/15 with the objective to cover all the activities required to ensure quantitative and qualitative improvement in livestock production systems and capacity building of all stakeholders, has a specific IEC component as part of its programme.

DADF have a website which is frequently updated with technical information but the site layout could be improved, made easier to navigate and to access the required information. Updates are managed by the National Informatics Centre (NIC) who also provide electronic and video telecommunications between the central and state departments and on down to the district and block level.

National communication programmes are developed, e.g. to provide information on the FMD-CP using radio, TV, newspapers and social media. There is also a help-line for the public to inquire about any DADF programmes.

Mobile phones and different apps facilitate communication directly with farmers. Veterinary officers receive a telephone allowance for communication with farmers and colleagues.

For most communication on specific topics or for coordination purposes, 'Whatsapp' is used as the preferred means of communication. Many senior officers set up 'Whatsapp groups' on which they are connected to all relevant people and can link to them at any time. For example, in the Punjab, SMS directories of field veterinarians, producer organisations (poultry, pig, dairy) are used to inform clients and veterinarians about action plans such as for vaccination campaigns. A contact number is always provided for further inquiries.

In Uttar Pradesh there is a NIC unit with AHD staff that directs all bulk mail or group emails to the relevant government institutions but also to other stakeholders as appropriate.

Many states have central contact points for the public, for example in Uttar Pradesh's 'control room' where the public can call any time of day. All complaints get recorded onto in-house

software with an allocated priority. The system generates an SMS to the appropriate district officers who must attend to the complaint within 30 days – the 'Integrated Grievance Redress System Uttar Pradesh ' automatically follows up the complaint until it is resolved.

States generally have strong ongoing communications with animal owners, industry, NGOs, veterinary colleges and research institutes. Communications focus on extension services, vaccination, AI and basic clinical services and treatments; resources including staff are available to undertake this work.

In a number of states, EMRI (Emergency Management and Research Institute) is now providing emergency management services for animal health. EMRI usually operates as a not-for-profit professional organisation under a Public Private Partnership (PPP) mode, often with GVK. The 1962 is the national animal emergency number. Staff receiving calls provide initial assessment and advice and then connect to the nearest clinic or mobile clinic to respond to the case. They cooperate with AHD and 56 NGOs to attend to the cases. They received 12,409 calls in January 2018. The 1962 emergency number service is now available in Gujarat, Tamil Nadu, Telangana, Madhya Pradesh and is being initiated in Uttar Pradesh. In the Punjab a call-centre at AHD HQ has been established with a panel of veterinarians on duty 24 hours a day. Most states provide a toll-free number for the public, 'common user groups' and farmers to call,

Strengths:

- Good technical infrastructure is provided at state and central level by NIC which reduces the need for physical meetings by replacing them by video-conferencing.
- National level communication materials are available in many different languages
- Most states have toll-free call numbers for farmers to inquire about programmes run by AHD
- Farmers are contacted directly about vaccination programmes and dates

Weaknesses:

- Guidelines and Reports on the DADF website are undated
- DADF website does not provide a good overview of the animal health situation and services offered
- Lack of a comprehensive communication plan at central level

Recommendations:

- Improve the accessibility and reliability of the DADF website which should provide disease information and give the dates and version of all guidelines and reports; also provide a list by topics/sub-topics with short descriptions to enable easy access and include links to other relevant websites
- Develop a comprehensive communication plan at central and state levels

III-2 Consultation with interested parties	Levels of advancement
The capability of the VS to consult effectively with interested parties on VS activities and programmes, and on developments in animal health and food safety. This competency includes collaboration with relevant authorities, including other ministries and Competent Authorities, national agencies and decentralised institutions that share authority or have mutual interest in relevant areas	1. The VS have no mechanisms for consultation with interested parties.
	2. The VS maintain informal channels of consultation with interested parties.
	3. The VS maintain a formal consultation mechanism with interested parties.
	4. The VS regularly hold workshops and meetings with interested parties.
	5. The VS actively consult with and solicit feedback from interested parties regarding proposed and current activities and programmes, developments in animal health and food safety, interventions at the OIE (Codex Alimentarius Commission and WTO SPS Committee where applicable), and ways to improve their activities.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): JPW16, SUP5

Findings:

General

DADF consults with many stakeholders on policy development and input into planned programmes. The concerns of stakeholder consultations are usually focused on animal production interests and how to implement national programmes such as 'doubling farmer incomes by 2022', but the development of animal health strategies is seen as an essential support factor. Other policies and programmes such as zoonoses control are also developed in a consultative process.

NDDB consults and works as an interface between the producers and milk cooperatives and the FSSAI by providing expert opinion on farming of domestic food regulations.

Where separate Ministries for animal husbandry or dairy development or animal production exist, DADF consult with those to develop new programmes or to revise existing ones.

Consultation on wildlife issues focusses mainly on human-wildlife conflict and sick animals in the wild. The Wildlife Institute of India (WII, Uttarakhand), a GoI institute under the Ministry of Environment, Forest and Climate Change, is a key consultation partner. It also provides training possibilities for state veterinarians from all over the country. This way wildlife management knowledge is distributed in the country and also in the Region (participants from other countries in the region). There is now a network of trained state veterinarians that can assist in case of wild capture and translocation, sick wild animals, post mortems, surveillance of wild birds and disease investigation.

Consultation with the Indian Federation of Animal Health Companies (INFAH) covers a range of topics, examples include the reduction in use of antimicrobials under the One Health concept; the use of antimicrobials as growth promoters and ban of genetically modified products in animal feed.

The Bharatiya Agro Industries Foundation (BAIF), a public charitable trust formed in 1967, is present in 17 states and, in close consultation with DADF, works in breed improvement and animal health, with focus on full complementarity with DADF. Despite this intention, there is a certain degree of overlap in the areas of activity of BAIF with AHD activities. DADF outsources some areas to BAIF to provide AI (e.g. in all of Jharkhand) and vaccination services.

Gram Vikas Yojana is the rural development scheme of JK Trust. Similar to BAIF, its livestock development programme is present in 11 states with 3,518 Integrated Livestock Development (ILD) Centres staffed with veterinary para-professionals and veterinarians. These centres are

supported by a fleet of Mobile Veterinary Units (MVU). Each MVU runs six days a week and covers two ILDCs per day on a fixed schedule. Route charts are prepared and communicated to the villagers. Close consultation and cooperation with DADF at central and AHDs at state level integrate the veterinary services offered by JK Trust with the Government services.

States

States have a range of consultative meetings with stakeholders. Many consultations are informal and held infrequently but in some states are more formal and regular consultations take place with well organised producer and industry associations.

In many states rabies programmes are carried out in consultation between the state AHDs, the municipalities and NGOs such as SPCA and HSI India (Humane Society International). The main programme objectives are to reduce the stray dog population by sterilisation and to vaccinate against rabies.

RKVY central support project accepts proposals from the grassroots level. In order to develop such proposals, veterinarians in Kerala have meetings at village level to find out the needs. These proposals are compiled by the district office and from all Districts into proposals which are then evaluated and selected for submission to RKVY by the state AHD director.

Poultry producers are represented by associations and federations at state level, e.g. 'Awadh Poultry Owners Association' in Uttar Pradesh, which represents farmers that own 500 to 100,000 broilers in the Lucknow area; another association represents the layer farmers. These associations consult with the Poultry Development Department of the state AHD. The meetings take place only an *ad hoc* basis.

Punjab AHD meets quarterly with farmer associations. Recent consultations with pig farmers have discussed issues such as the cost of CSF vaccine and marketing of pigs from Punjab to the northeast states. Consultations have also been held with dairy farmers on issues of milk price, with goat farmers on issues of the inadequate supply of young stock (resolved by establishing a government goat farm).

Strengths:

- Programmes are developed in consultation with beneficiaries and their associations
- DADF realises where it cannot provide all services and outsources them to other parties
- Excellent wildlife training and research facilities and staff available for consultation by DADF
- Good cooperation with the pharmaceutical industry for common goals like reduction in use of antimicrobials

Weaknesses:

- Limited number of active national and state associations of livestock producers and industry

Recommendations:

- Strengthen and regularise the intake of veterinarians into the 'wildlife management' course at WII with the support from ICAR
- Intensify collaboration on research in wildlife for relevant livestock disease control programmes, e.g. virus reservoir in the wild for FMD
- Avoid duplication of services provided by state AHD with those offered by NGOs

III-3 Official representation *The capability of the VS to regularly and actively participate in, coordinate and provide follow up on relevant meetings of regional and international organisations including the OIE (and Codex Alimentarius Commission and WTO SPS Committee where applicable).*	Levels of advancement
	1. The VS do not participate in or follow up on relevant meetings of regional or international organisations.
	2. The VS sporadically participate in relevant meetings and/or make a limited contribution.
	3. The VS actively participate[21] in the majority of relevant meetings.
	4. The VS consult with interested parties and take into consideration their opinions in providing papers and making interventions in relevant meetings.
	5. The VS consult with interested parties to ensure that strategic issues are identified, to provide leadership and to ensure coordination among national delegations as part of their participation in relevant meetings.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SG 17, 21-30

Findings:

DADF participates regularly in OIE General Session with a delegation that usually includes the Secretary and Joint Secretary and the AHC, the effective CVO; the Secretary is the OIE Delegate, a non-vet. Other people may also attend the General Session including ICAR, the private sector and state AHD directors. Attendance has sometimes been limited by no veterinarian being part of the delegation. No comments have been received on the OIE Code Chapters from India in recent years. No Indian nominee has been proposed for any leadership positions within the OIE Regional Bureau or the OIE Council.

In the sub-region, the AHC attends the SAARC CVOs forums and the Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs) meetings held annually within South Asia. Recently India has demonstrated much greater engagement – for example, India sent a strong technical delegation to the recent FAO-OIE PPR Roadmap meeting for South Asia (Dhaka, Bangladesh). DADF also sometimes take part in some regional *ad hoc* OIE meetings, e.g. working equines, PPR, FMD.

Consultations and opinions are drawn from a range of government agencies and the private sector. DADF coordinates with the Ministry of Science and Technology on areas of biotechnology, the Ministry of Law and Justice on legal and legislative development, Ministry of Food Processing industries on livestock products and export of processed food products and the Ministry of Health on zoonoses, food standards and AMU/AMR. NDDB works as an interface between the producers and milk cooperatives and the FSSAI by providing expert opinion on farming of domestic food regulations.

Overall official representation by India to OIE international and regional meetings has been rather sporadic and limited; for example, India has not participated in the biennial OIE Regional Commission Conference for Asia, the Far East and Oceania within the last decade. This is unfortunate given the scale and importance of India to global animal health, and the technical skills available in the country.

India is much more involved in specific technical veterinary activities. For example, Indians have performed well as members of unelected OIE *ad hoc* groups e.g. ex-Chair of the OIE Animal Welfare Working Group, member of recent OIE *ad hoc* group on Welfare of Working Equids, and a current member on the OIE *ad hoc* group on Veterinary Para-professionals. They are also active in OFFLU via the National Institute for High Security Animal Diseases (NIHSAD). NIHSAD is also an OIE Reference Laboratory for AI and the FMD Laboratory in Mukteshwar is part of the FAO/OIE FMD reference laboratory network.

[21] *Active participation* refers to preparation in advance of, and contributing during the meetings in question, including exploring common solutions and generating proposals and compromises for possible adoption.

State laboratories have participated in OIE Twinning projects (e.g. NRCE on glanders, EI and piroplasmosis, and Karnataka University on rabies). In addition, ICAR institutions receive substantial international funding and have many collaborative research projects in animal health and production with renowned international institutions (e.g. National Dairy Research Institute reported on 104 externally funding projects in 2018).

Indian participation in Codex Alimentarius Commission meetings is excellent with full administrative and technical representation, and a strong leadership role. For example, the Chairman of the Agricultural and Processed Food Products Export Development Authority (APEDA) was the Chair of the Codex Alimentarius Commission from 2011-2014 and Vice Chair from 2008-2011. India also hosts the Codex committee on spices and culinary herbs. They are active participants in a range of other committees including the Codex Committee on Food Import and Export Inspection and Certification Systems. India currently chairs the Codex Regional Coordinating Committee for Asia.

Strengths:

- Strong international collaboration on technical activities of the OIE and other international partners
- Excellent scientific expertise available including within ICAR institutions and international reference laboratories
- Increased international engagement with the OIE – including via the PVS Pathway
- Excellent international participation and leadership within Codex Alimentarius

Weaknesses:

- Limited participation in OIE regional meetings and to the OIE General Session
- No comments submitted on the OIE Code
- No nominations for elected OIE Council, Bureau or Specialist Commissions
- India does not take the leadership role internationally expected of such a large country with such a large and critically important livestock sector

Recommendations:

- India should take greater leadership internationally in developing standards, policies and programmes
- Engage more with OIE both institutionally and technically – nominate for institutional (Council/Bureau) and technical (Specialist Commissions) leadership positions
- Provide comments on the OIE Codes and Manuals, either as a country or via the 'regional common position' mechanisms; ensure OIE correspondence is handled in a timely and effective manner
- Provide a list of experts to the OIE that might also be considered for OIE *ad hoc* groups.
- Host OIE or other international animal health meetings

III-4 Accreditation / authorisation / delegation *The authority and capability of the public sector of the VS to accredit / authorise / delegate the private sector (e.g. private veterinarians and laboratories), to carry out official tasks on its behalf.*	Levels of advancement
	1. The public sector of the VS has neither the authority nor the capability to accredit / authorise / delegate the private sector to carry out official tasks.
	2. The public sector of the VS has the authority and capability to accredit / authorise / delegate to the private sector, but there are no current accreditation / authorisation / delegation activities.
	3. The public sector of the VS develops accreditation / authorisation / delegation programmes for certain tasks, but these are not routinely reviewed.
	4. The public sector of the VS develops and implements accreditation / authorisation / delegation programmes, and these are routinely reviewed.
	5. The public sector of the VS carries out audits of its accreditation / authorisation / delegation programmes, in order to maintain the trust of their trading partners and interested parties.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SG23

Findings:

State AHDs are authorised under the Prevention and Control of Contagious and Infectious Diseases Act (2009) to “authorise any person to exercise any power or discharge any duty as a Competent Officer, under this Act, who shall exercise such powers and such duties within the local limits of his jurisdiction as may be specified in the notification”.

At present state AHDs do not delegate responsibility for the performance of any public functions to private registered veterinarians. However, in some states the shortfall in numbers of veterinarians occupying sanctioned posts is being reduced through the award of contracts to veterinarians who are hired to operate mobile veterinary clinics, which are funded through central government support through the Establishment and Strengthening of Veterinary Hospitals and Dispensaries (ESVHD) scheme. These veterinarians are designated as state veterinarians, although since they do not hold a permanent position these veterinarians do not enjoy the same benefits (learning opportunities and pension rights) as those held by permanent members of staff.

In addition to the above central government supported scheme, many state AHDs, especially those with insufficient numbers of veterinarians and veterinary para-professionals have signed or made informal agreements with various non-state actors (NSAs) to provide animal health services either via mobile units or through establishment of static health centres. For example, one such NSA, GVK-EMRI has deployed 100 mobile clinics, operating through a toll-free access number in Telangana, in collaboration with the state AHD. Another example is in Madhya Pradesh where private veterinarians are contracted to deliver field services to remote and tribal areas; the contract is tendered and the contract awarded to a group to supply veterinary services.

Amongst the various Competent Authorities responsible for implementing regulatory functions within the veterinary domain there are several examples where other institutions are authorised to perform official functions or provide specific official services. Under the authority of the Food Safety and Standards Act, the states and UTs are responsible for the enforcement of the provisions of the Act, Rules and Regulations. The FSSAI accredits laboratories located within the larger meat and milk plants through a ‘notification’ to sample and test animal products for the quality and safety of foods prior to dispatch and distribution to retail outlets.

The AWBI delegates to the Society for the Protection of Cruelty to Animals (SPCA) and other similar NSAs the responsibility for enforcement of the rules and regulations made by the central government under this Act. The responsibility for implementation of the Act falls within the mandate of municipal and local authorities. The SPCA has centres in each state often

associated with the district veterinary hospitals. The district SPCAs are delegated by the AHD to provide certain veterinary services and are responsible for catching and caring for abandoned animals (mainly male cattle and stray dogs). For instance, the district SPCA centre located at Palam District Veterinary Hospital in Delhi employs three veterinarians and operates two ambulances. The district SPCA looks after abandoned cattle and dogs at gaushalas and conducts capture, neuter, vaccinate and release programmes as well as holding periodic rabies vaccination camps.

Similarly, the DADF has delegated the authority to develop and publish regulations, under the Veterinary Council of India Act, to the Veterinary Council of India.

In some states private veterinary para-professionals, gopal mitras and artificial insemination technicians are engaged informally to assist with carrying out vaccination campaigns at veterinary camps.

Private veterinary practices, commonly established in larger cities (Delhi alone has more than 200 private, mostly companion animal practices) and towns, are expected, in accordance with the provisions defined in the Prevention and Control of Contagious and Infectious Diseases Act, to report the suspected occurrence of any scheduled animal diseases to their nearest veterinary officer/state AHD.

The Drug Control Authority is authorised to approve facilities which manufacture biologicals. In this manner several private vaccine production laboratories are accredited to produce animal vaccines including those used for national control programmes such as FMD-CP, PPR-CP and Brucellosis-CP.

Strengths:

- VS have the legal authority to delegate activities to veterinarians and non-state actors
- The SPCA network operates an extensive animal care and welfare programme
- Increasing numbers of private veterinary practitioners are becoming available and could be contracted to perform certain public functions, such as, for instance ante- and post mortem meat inspection.

Weaknesses:

- State AHDs do not delegate activities in spite of a shortage of manpower in many states

Recommendations:

- Establish a human resources/manpower needs working group to review staffing needs of the VS – both central and at state levels
- State AHDs may consider contracting private veterinarians to perform specific activities such as ante- and post mortem meat inspection

III-5 Veterinary Statutory Body (VSB) A. VSB authority *The VSB is an autonomous regulatory body for veterinarians and veterinary para-professionals.*	Levels of advancement
	1. There is no legislation establishing a VSB.
	2. The VSB regulates veterinarians only within certain sectors of the veterinary profession and/or does not systematically apply disciplinary measures.
	3. The VSB regulates veterinarians in all relevant sectors of the veterinary profession and applies disciplinary measures.
	4. The VSB regulates functions and competencies of veterinarians in all relevant sectors and veterinary para-professionals according to needs.
	5. The VSB regulates and applies disciplinary measures to veterinarians and veterinary para-professionals in all sectors throughout the country.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): JW10, JW31, JW32, JW47, JW73, JW76, SKA11, SKA28, SKA36, HLB14,

Findings:

The Veterinary Council of India (VCI) is established as the Veterinary Statutory Body under the Indian Veterinary Council Act (1984) (IVC Act). The main functions of the VCI are 'the regulation of veterinary practice and for maintaining uniform standards of veterinary education' (see also CC I-2A).

Registration of veterinarians to practise veterinary medicine[22] is mandatory at both central and state levels. All states and UTs, except Jammu and Kashmir, have adopted the VCI Act. The central government is authorised to make rules for implementation and enforcement of the provisions made under the IVC Act.

The Act (chapter 2) makes a number of provisions including:

- Establishment of the Council
- The composition, terms of membership of the Council members and minimum frequency of Council meetings
- Establishment of an Executive Committee and other sub-committees of the Council
- Appointment of inspectors and 'visitors' for inspection and regulation of veterinary universities and colleges
- Authority of the Council to make regulations specifying the minimum standards of veterinary education required for granting recognised veterinary qualifications by veterinary institutions in those states to which the Act extends

The VCI cannot be considered to be a fully autonomous body, as defined by OIE, for the following reasons:

- 14 of the 27 members of the Council including the secretary/registrar/treasurer are nominated by central government, and only 11 members are elected from amongst registered veterinarians.
- The quorum for a Council meeting is 9 members, all of whom may be nominated members (The Act, rules and regulations provide no guidance on the composition of a quorum.) Similarly State Veterinary Councils are comprised of 6 nominated members and only 3 elected members, thus a bias exists in favour of central government and state institutions in both the VCI and State Veterinary Councils.
- Funding of the VCI is derived largely from a grant provided by central government and through collection of registration fees and fees levied on veterinary universities and colleges for inspections and approval of veterinary qualifications, staffing levels, infrastructures and training facilities.

[22] "veterinary medicine" means modern scientific veterinary medicine in all its branches and includes veterinary surgery and obstetrics.

The central government, on the recommendation of the Council, may withdraw approval of a qualification in the event that the Council finds that 'the courses of study and examinations… and proficiency required...are not in conformity with the regulations' or that 'the staff, equipment, accommodation, training and other facilities…in such veterinary institution…do not conform to the standards prescribed by the Council'. Withdrawal of an approved veterinary qualification is through an amendment to the First Schedule of the Act and published in the Official Gazette.

The IVC Act makes provisions for the registration of veterinarians and maintenance of the India Veterinary Practitioners Register (IVPR). Provisions of the act include maintenance of a veterinary register (the IVPR), with the provision of state registers to the IVPR and the opportunity to include a post-graduate qualification. Currently the Council has no established any programme for specialist qualifications.

The IVC Act also defines the privileges of registered veterinary practitioners including the requirement that government designated veterinary posts must be occupied by registered veterinary practitioners and that only veterinary practitioners may practice veterinary medicine. The Act permits state governments to allow a veterinary supervisor, stockman or stock assistant, i.e. veterinary para-professionals (with defined minimal qualifications) to provide minor veterinary services under veterinary supervision. Minor veterinary services are defined by the states and include activities such as vaccination, castration, and dressing of wounds, and other types of preliminary aid or treatment. All states, except Jammu and Kashmir, have issued a Notification which defines minor veterinary services; there is some variation between states; for instance, artificial insemination is included in some states but not in others.

Each state registers its own veterinary graduates when they graduate with a veterinary degree from an approved veterinary faculty; each state submits an annual update to the central VCI in April.

There are currently 72,216 names of veterinarians registered on the IVPR, (*pers. comm*. with Registrar VCI India on 12/04/18).

If a veterinarian wishes to move and practice veterinary medicine in a different state he/she must apply to the new state VC in order to be registered there. Provided that there is no case pending against the applicant and he/she has paid registration fees, assuming no outstanding issues (fees, disciplinary), the parent state issues a No Objection Certificate to the registrar of the new state. It is not possible for a veterinarian to be registered in two states at the same time. If a private veterinarian has a practice close to a state boundary and he wishes to practice in the adjoining state, then the State Council of the concerned state will not normally object, although a State VC may rule against such practice if a complaint is lodged as it is not foreseen in the Act to be able to practice in two states at the same time.

In most states where the VC is active, disciplinary committees have been established to conduct enquiries into alleged cases of misconduct or malpractice, guided by the VCI, Standard of Professional Conduct, Etiquette and Code of Ethics, for Veterinary Practitioners Regulations. The VC in Jharkhand has never been active since the date it was to have been established, (2006), due to the state government not appointing any members. (In some states the AHD directors are not veterinarians and ineligible to be a member of the State Council (e.g. Jharkhand, Bihar and Assam.)

In accordance with the Act, the central government has established an 'Advisory Committee' which has been delegated the authority to act in the place of the Council until such time as the Council can make any recommendations on the recognition of veterinary qualifications or veterinary colleges as per the Act within the specified period of time as required.

There is a veterinary para-professional council operational in Himachal Pradesh.

Strengths:

- Legislation with regulations in place Indian Veterinary Council Act
- Established national Veterinary Council and State Veterinary Councils regulate the practice of veterinary medicine and the quality of undergraduate veterinary education
- Rules under the Act and its regulations notified to the Gazette of India by MoA&FW

Weaknesses:

- The VCI is not a fully autonomous body, as defined by OIE
- State Veterinary Council rarely take disciplinary action
- Only one state has a statutory body to regulate the activities of veterinary para-professionals
- State Veterinary Councils not functional in some states
- Not officially possible for a registered veterinarian to carry out veterinary activities in more than one state

Recommendations:

- Review the autonomy of the VCI and address shortcomings to comply with OIE standards
- Consider options for VCI, or another statutory body to regulate veterinary para-professionals uniformly throughout the country
- Establish active state disciplinary committees to regulate the practice of veterinary medicine by registered veterinarians and veterinary para-professionals
- VCI to become more actively involved with the CDSCO/MoH&FW to promote improved management and prudent use of veterinary medicines
- Revise registration standards to allow registered veterinarians to work in two or more states

B. VSB capacity *The capacity of the VSB to implement its functions and objectives in conformity with OIE standards.*	Levels of advancement
	1. The VSB has no capacity to implement its functions and objectives.
	2. The VSB has the functional capacity to implement its main objectives.
	3. The VSB is an independent representative organisation with the functional capacity to implement all of its objectives.
	4. The VSB has a transparent process of decision making and conforms to OIE standards.
	5. The financial and institutional management of the VSB is submitted to external auditing.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): JW31, JW32, JW47, JW73, JW74

Findings:

Both the VCI and State Veterinary Councils maintain their respective registers accurately.

Registered veterinarians are only required to provide changes in physical address, as and when these details change, thus neither the VCI nor State Veterinary Councils are able to distinguish between differences in types of employment of their registered members. The Council is in the process of developing software for online registration of veterinary practitioners with the State Veterinary Councils and the VCI.

The VCI is empowered by the IVC Act (1984) to define the professional and ethical standards to be followed by registered veterinarians throughout India. All states, with the exception of Jammu and Kashmir, have issued a 'Notification' which defines the range of veterinary interventions which comprise 'minor veterinary services'.

Both the national VCI and the active State Veterinary Councils have established disciplinary committees which can review and make judgements on alleged acts or omissions which may constitute professional misconduct. It is rare for disciplinary allegations to be made or any such cases to be brought before the Councils. In some states (e.g. Tamil Nadu, Punjab and Karnataka), Council members reported that suspension or fines had been imposed on veterinarians and on veterinary para-professionals for disciplinary matters.

The State Veterinary Councils have limited resources available to carry out inspections which restricts the detection of non-compliance and inappropriate veterinary practice being undertaken by veterinarians and veterinary para-professionals.

The VCI has been unable to function fully since 2016 due to legal issues relating to the re-appointment of the president of the India Veterinary Association; also, in some states the Director of the AHD is a not a veterinarian and thus ineligible for nomination as a member of the State Veterinary Council (e.g. Bihar, Assam and Jharkhand) so the State Veterinary Council is unable to have a full quota of nominated members. (See also CCIII-5A)

The fees charged for initial registration and renewal of registration by the State Veterinary Councils are defined in law and are outdated in terms of value, (not exceeding 25 INR for registration and 15 INR for renewal, once every 5 years (IVC Act)). The State Veterinary Councils in Himachal Pradesh has recently significantly increased these charges.

The VCI is not sufficiently well resourced to allow it to evaluate all potential reciprocating veterinary colleges in other countries.

Strengths:

- The VCI and State Veterinary Councils have the technical authority to and are regulating undergraduate veterinary education
- The VCI and State Veterinary Councils have the authority to regulate the practice of veterinary medicine in accordance with norms defined in regulations

Weaknesses:

- The VCI and most State Veterinary Councils are not sufficiently well resourced to perform all of their functions effectively
- There is no Veterinary Statutory Body which has the full powers and authorities to regulate the training and practices of veterinary para-professionals

Recommendations:

- VCI and State Veterinary Councils should extend their regulatory control to cover veterinary para-professionals – alternatively, a separate veterinary statutory body for the regulation of veterinary para-professional training and practices should be established
- Review the fees for registration and renewal of registration to bring them in line with current costs and values for services – consider defining such fees in regulations which can be amended easily and updated more frequently

III-6 Participation of producers and other interested parties in joint programmes *The capability of the VS and producers and interested parties to formulate and implement joint programmes in regard to animal health and food safety. This competency includes collaboration with relevant authorities, including other ministries and Competent Authorities, national agencies and decentralised institutions that share authority or have mutual interest in relevant areas*	Levels of advancement
	1. Producers and other interested parties only comply and do not actively participate in programmes.
	2. Producers and other interested parties are informed of programmes and assist the VS to deliver the programme in the field.
	3. Producers and other interested parties are trained to participate in programmes and advise of needed improvements, and participate in early detection of diseases.
	4. Representatives of producers and other interested parties negotiate with the VS on the organisation and delivery of programmes.
	5. Producers and other interested parties are formally organised to participate in developing programmes in close collaboration with the VS.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SG6, SKA15

Findings:

DADF and state AHDs work with industry associations to support delivery of key policy initiatives and disease surveillance and control programmes. A particular focus for Government is the objective of doubling farmers' incomes by 2022 and DADF and state AHDs are working with industry groups and directly with producers to achieve this through increased production and improved marketing. Many of the DADF programmes focus on production and not directly on animal health and disease surveillance and control, though a strong synergy should always exist.

Dairy cooperatives are organised into dairy federations, such as the Gujarat Coop Milk Marketing Federation (GCMMF) in Gujarat, the Pradeshik Coop Dairy Federation (PCDF) in Uttar Pradesh, the Uttarakhand Coop Dairy Federation (UCDF) and many others. These federations cooperate closely with the state AHDs and use their veterinary services, even though they may also engage their own veterinarians and veterinary para-professionals.

There is consultation for development projects in the dairy sector at multiple levels, e.g. at central level the National Programme for Dairy Development (NPDD) has a technical management committee headed by the Principal Secretary with Dairy Development and the Director and Secretary of AHD as members. At State level one example is the 'Ganga Gaya Scheme' in Uttarakhand which has a state level committee headed by the Secretary, Dairy Development with the Director AHD as a member; under this scheme dairy cows are distributed to women. The related district level committee, is headed by the District Magistrate and has the District Chief Veterinary Officer as a member.

There is also extensive consultation with producers on implementation of poultry production projects offered by DADF, such as the Innovative Poultry Productivity Project-low-Input – Technology-birds (IPPP-LIT) under the National Livestock Mission. The consultative process led to the selection of priority states.

The 'Indian Egg Processors Association' and the 'All India Poultry Breeder Association' hold quarterly meetings with DADF at the central level and with state AHDs to consult on new policies and to ensure that their producers are included in DADF/AHD sampling schemes with testing at the RDDLs. These major associations represent 80% of India's large-scale poultry producers; these producers use a mix of direct production and 'contract farming' by smaller producers.

A joint programme to reduce the use of antimicrobials is currently being prepared by the poultry associations with DADF.

DADF provides these associations with draft OIE Code chapters for comment. Disease issues relevant to export of poultry products are also often brought to their attention by DADF.

The setting up of poultry compartments in line with OIE chapter 4.3. and 4.4 by the industry and the approval by DADF is based on extensive consultation in a public-private-partnership.

Consultation with breeder associations, farmer associations and village groups is always a part of establishing disease control programmes (IEC component of CPs, see III-1). The PPR-CP is currently being launched and extensive consultation is taking place to establish the best approach to mass vaccination of small ruminants with the support of the stakeholders.

Strengths:

- DADF and state AHDs priority is improving production – animal health is seen as an important supporting element
- Producer associations benefit from the wide range of services provided by state AHDs, e.g. training courses for veterinary para-professionals, artificial insemination technicians and training in poultry farming
- Producer associations work with government as they see the benefit from the specific support provided, such as semen production and distribution, chick and poultry distribution and small ruminant improvements and supply
- The establishment of poultry compartments for international trade is a joint programme between government and private producers (see CC IV-8 for details)

Weaknesses:

- Formal regular meetings with producer organisations take place at central level but infrequently at state and district levels
- Veterinary units at block and field level are rarely able to cater for specific needs such as antimicrobial sensitivity testing and vaccination of poultry; such support should be provided by the private sector

Recommendations:

- Hold regular formal meetings with producer organisations at central and at state and district levels
- Work with the private sector to increase support for the government by providing additional activities such as antimicrobial sensitivity testing and vaccination of poultry

III.4 Fundamental component IV: Access to markets

This component of the evaluation concerns the authority and capability of the VS to provide support in order to access, expand and retain regional and international markets for animals and animal products. It comprises eight critical competencies.

Critical competencies:

Section IV-1	**Preparation of legislation and regulations**
Section IV-2	**Implementation of legislation and regulations and compliance thereof**
Section IV-3	**International harmonisation**
Section IV-4	**International certification**
Section IV-5	**Equivalence and other types of sanitary agreements**
Section IV-6	**Transparency**
Section IV-7	**Zoning**
Section IV-8	**Compartmentalisation**

Terrestrial Code References:

Points 6, 7 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General organisation / Procedures and standards.

Points 1 and 2 of Article 3.2.7. on Legislation and functional capabilities: Animal health, animal welfare and veterinary public health / Export/import inspection.

Points 1 and 3 of Article 3.2.8. on Animal health controls: Animal health status / National animal disease reporting systems.

Sub-point g) of Point 4 of Article 3.2.10. on Veterinary Services administration: Trade performance history.

Article 3.2.11. on Participation in OIE activities.

Points 6 and 10 of Article 3.2.14. on Veterinary legislation, regulations and functional capabilities / Membership of the OIE.

Chapter 3.4. on Veterinary legislation.

Chapter 4.3. on Zoning and compartmentalisation.

Chapter 4.4. on Application of compartmentalisation.

Chapter 5.1. on General obligations related to certification.

Chapter 5.2. on Certification procedures.

Chapter 5.3. on OIE procedures relevant to the Agreement on the Application of Sanitary and Phytosanitary Measures of the World Trade Organization.

Chapters 5.10. to 5.12. on Model international veterinary certificates.

IV-1 Preparation of legislation and regulations *The authority and capability of the VS to actively participate in the preparation of national legislation and regulations in domains that are under their mandate, in order to guarantee its quality with respect to principles of legal drafting and legal issues (internal quality) and its accessibility, acceptability, and technical, social and economical applicability (external quality). This competency includes collaboration with relevant authorities, including other ministries and Competent Authorities, national agencies and decentralised institutions that share authority or have mutual interest in relevant areas*	Levels of advancement
	1. The VS have neither the authority nor the capability to participate in the preparation of national legislation and regulations, which result in legislation that is lacking or is out-dated or of poor quality in most fields of VS activity.
	2. The VS have the authority and the capability to participate in the preparation of national legislation and regulations and can largely ensure their internal quality, but the legislation and regulations are often lacking in external quality.
	3. The VS have the authority and the capability to participate in the preparation of national legislation and regulations, with adequate internal and external quality in some fields of activity, but lack formal methodology to develop adequate national legislation and regulations regularly in all domains.
	4. The VS have the authority and the capability to participate in the preparation of national legislation and regulations, with a relevant formal methodology to ensure adequate internal and external quality, involving participation of interested parties in most fields of activity.
	5. The VS regularly evaluate and update their legislation and regulations to maintain relevance to evolving national and international contexts.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): JW9, JPW4, JPW9, JPW40, JPW41, JPW75, SG6, SKA3, SKA5, HLB25 and discussions with DADF staff, and findings and observations during the mission in the states.

Findings:

India's Constitution provides for a Parliamentary form of government, which is federal in structure with certain unitary features. Acts are promulgated under the Constitution and allow for Rules, Regulations and Notifications/Orders. States have to follow All India (National) Acts but may introduce their own Acts and subordinate legislation. States should not contradict the All India Acts except in certain exempted areas as mentioned in the Constitution, e.g. slaughter of cattle which varies from state to state and is a state matter.

The DADF can instigate draft legislation with the help of legal drafters. Once a draft is finalised after a period of internal and external consultations it can be passed to the legislature where it has to pass through both houses of Parliament where it may be amended. Once the Bill is agreed by both houses it needs to be signed off by the President. Then it can be published in the Gazette of India and becomes law. Usually the legislation has a date of entering into force and if not specified then it would be the date of gazetting. In some or most cases the states are given freedom to choose a date of entering into force and may even have different dates for different parts of the state. There is no compulsion for a state to actually introduce or comply with the required legislation.

There is a website for the national legislation[23]. States have their own individual websites and are also included in the national website. Some of the legislation is old, out of date and needs reviewing. There are legislative gaps and states have generally some gaps and disconnects with the national laws, and there are inconsistencies and unclear texts in their interpretations of the All India laws. For example, the definition of a 'para-veterinarian' is not clear as in some states they are referred to as 'veterinary pharmacists'; other terminology is also used. The definition of what a 'para-veterinarian' (more commonly referred to as a 'para-vet') can do is

[23] http://www.liiofindia.org/databases.html.

also misleading and not clear as states have interpreted this differently, e.g. a so called 'para-veterinarian' may carry out minor veterinary services according to the Indian Veterinary Council Act (1984) but the interpretation for this is not always clear or consistently laid down by the states. Some states have adopted legislation for creating a 'para-veterinary' council others have not.

There are also gaps in the legislation, for example, there are no detailed meat inspection rules, no detailed rules on stunning or killing of animals, no animal health rules on artificial insemination centres (bull stations) (except that Punjab stated they are the first state to enact an "animal breeding Act" in 2016) and no rules on animal feed. In addition, under the Indian Veterinary Council Act, a veterinarian cannot work in two different states, as the legislation does not allow for this possibility. Overall, the Indian legislation tends to be weak on detailed technical rules and regulations and there are some difficulties with splits of veterinary legislation between the different ministries.

In many cases it would be useful to include annexes or schedules in the Acts, which can be amended more easily than the Act itself, e.g. for fines. The utility of this approach is clear in the Prevention and Control of Infectious and Contagious Diseases in Animals Act, where the schedule contains the list of diseases, which may be amended by a simple notification.

There is legislation covering controls at animal markets but this has not been implemented and there are some other areas where legislation is laid down but not implemented at the state level.

These is a need to undertake a thorough evaluation and comparison of the legislation at national and state level. In addition, the intrinsic quality of the legislation needs to be reviewed. A serious concern is the lack of proper implementation of some of the legislation at state level which needs to be rectified (see CC IV-2).

The main Acts and Rules of India in the veterinary domain are:

- The prevention and control of infectious and contagious diseases in animals Act, 2009;
- The prevention and control of infections and contagious disease of animals (form of vaccination certificate, manner of post-mortem examination and disposal of carcass) Rules, 2011;
- The prevention of cruelty to animals Act, 1960;
- The prevention of cruelty to animals (licensing of farriers) Rules, 1965
- The prevention of cruelty to draft and pack animal Rules, 1965;
- The prevention of cruelty to animals (registration of cattle premises) Rules, 1978;
- The prevention of cruelty to animals (transport of animals on foot) Rules, 2001;
- The prevention of cruelty to animals (slaughter house) Rules, 2001;
- The prevention of cruelty to animals (establishment and regulation of societies for the prevention of cruelty to animals) Rules, 2001;
- The animal birth control (dogs) Rules, 2001;
- The performing animals Rules, 2001, (amended in 2005);
- The prevention of cruelty to (animals slaughterhouse) (amendment) Rules, 2010;
- The prevention of cruelty to animals (regulation of live stock markets) Rules 2017;
- The prevention of cruelty to animals (care and maintenance of case property animal) Rules 2017 (concerns the custody of animals pending litigation, their cost and disposal etc.);
- The prevention of cruelty to animals (dog breeding and marketing) Rules, 2017;
- The breeding of and experiments on animals (control and supervision) Rules, 1998 (amended 2001 and 2006);
- The transport of animals Rules, 1978;
- The transport of animals (amendment) Rules, 2001;
- The transport of animals (amendment) Rules, 2009;

- The central motor-vehicle (11th amendment) Rules, 2015 (concerns the space allowances and ISO standards)
- The livestock importation Act, 1898 (amended in 2001);
- The livestock importation (amendment) Act, 2001;
- The drugs and cosmetic Act, 1940 (a number of Rules have been made under this);
- The Export (Quality Control and Inspection) Act, 1963
- The Export (Quality Control and Inspection) Rules, 1964
- Meat food products Order, 1973;
- Prevention of food adulteration Act, 1954;
- Meat food products Order, 1973;
- Milk and milk products Order, 1992;
- The food safety and standards Act, 2006;
- The food safety and standards Regulations, 2011;
- The agriculture and processed food products export development authority Act, 1985;
- The essential commodities Act, 1955
- Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011 - Part II (Appendix A: Food Additives);
- Food safety and standards (food products standards and food additives) Regulations, 2011 - Part II (Appendix B: microbiological parameters);
- Food safety and standards (prohibition and restrictions for sale) Regulations, 2011;
- Food safety and standards (contaminants and taints) Regulations, 2011;
- Food safety and standards (packaging and labelling) Regulations, 2011;
- Food safety and standards (Licensing and registration of food businesses) Regulations, 2011 in schedule 4, part IV, specific hygiene and sanitary practices to be followed by food business operators engaged in manufacture, processing, storage and selling of meat and meat products;
- The national disaster management Act, 2005;
- Foreign trade regulation Act, 1992 (as amended);
- Indian veterinary council Act, 1984;
- Public procurement Act;
- Wildlife protection Act 1972 (recognition of zoos come under this Act);

Strengths:

- Comprehensive legislation
- Legislation has reasonable good internal and external quality
- Rules, regulations, orders and notifications can be easily enacted provided primary legislation is available

Weaknesses:

- Some legislation in the veterinary domain is handled by other ministries
- There are gaps in the legislation, e.g. no meat inspection, animal feed or artificial insemination rules
- Uneven state legislation as some states have enacted their own legislation as required others have not
- Some legislation lacks detailed technical requirements
- Some old and out of date legislation
- In some areas, e.g. welfare, there are numerous pieces of legislation which could be amalgamated

Recommendations:

- Improve the technical details of legislation, e.g. the rules for stunning animals
- Review state legislation to ensure its applicability and consistency
- Identify gaps in the current legislation and draft the necessary legal texts
- Update old legislation to reflect changes and scientific advances

- Review legislation with other ministries to ensure that the veterinary domain is fully covered; review the need for MoUs with relevant ministries as necessary
- Consolidate legislation covering the same topic e.g. animal welfare to improve clarity and transparency.

IV-2 Implementation of legislation and regulations and compliance thereof *The authority and capability of the VS to ensure compliance with legislation and regulations under the VS mandate.*	Levels of advancement
	1. The VS have no or very limited programmes or activities to ensure compliance with relevant legislation and regulations.
	2. The VS implement a programme or activities comprising inspection and verification of compliance with legislation and regulations and recording instances of non-compliance, but generally cannot or do not take further action in most relevant fields of activity.
	3. Veterinary legislation is generally implemented. As required, the VS have a power to take legal action / initiate prosecution in instances of non-compliance in most relevant fields of activity.
	4. Veterinary legislation is implemented in all domains of veterinary competence and the VS work to minimise instances of non-compliance.
	5. The compliance programme is regularly subjected to audit by the VS or external agencies.

Terrestrial Code reference(s): Appendix 1

Evidence *(listed in Appendix 5):* HLB1-5, SKA16

Findings:

Non-compliance with the legislation is a major concern in some critical areas of the VS including particularly animal welfare (including animal transport and slaughter), movement across state boundaries, illegal imports at the land borders, over the counter sales of veterinary medicines and their use by veterinary para-professionals.

As an example of compliance with legislation the Delhi Society for the Protection of Cruelty to Animals (DSPCA) monitors the implementation of the Prevention of Cruelty to Animals Act. One of their tasks involves monitoring and submitting for prosecution to the courts themselves or via the police animal welfare transport or other infringements. During the ten month period, April 2017 - January 2018, there were a significant number of infringements and penalties (see table16). This reflects the scale of the animal welfare transport problems in one city. It also needs to be recognised that the VS are not directly involved in this work.

Table 16: Total cases/seizures and fines realised by the Delhi court April 2017 to January 2018

DSPCA cases	Police cases	Trucks Seized by DSPCA	Trucks seized by police	Number of animals seized by DSPCA	Number of animals seized by police	Revenue collected as fines (INR)
648	441	324	1273*	25,878	21,606	30,384,104

*This includes 6 bullock carts.

There are numerous roads crossing between states and unauthorised movements of livestock are known to occur but is difficult to quantify without the necessary checks being carried out. The movement controls on animal transports at the state borders are inadequate. There are also unauthorised animal movements across some of the international land borders with few efforts at control being made.

Information from AQCS regarding seizures and penalties at BIPs was requested but was not received. AQCS are concerned with illegal imports for commercial purpose, e.g. animal parts, breeding animals; medicinal drugs.

There are understood to be some problems with illegal or unscrupulous semen production and uncontrolled insemination activities but no evidence was available.

Food Safety Inspectors check meat being sold in shops and stalls to ensure that meat being sold is stamped as fit for human consumption. No details of the number of infringements were given but it was stated that this happens from time to time.

Some penalties have not been reviewed and increased for many years and are no longer a sufficient deterrent.

A serious concern is the lack of proper implementation of some of the legislation at state level which also should be rectified, e.g. market controls and animal movement controls including ID, animal welfare and in some public health aspects (see relevant CCs for details).

Strengths:

- NGOs and police support welfare compliance activities
- Some good awareness activities

Weaknesses:

- No consolidated reports on compliance activities and rates of non-compliance
- Lack of compliance activities addressing animal movements at state and international land borders
- Lack of sufficient controls and checks of veterinary medicines sold at pharmacies
- Penalties are generally too low
- There is a serious lack of implementation of legislation in some areas.

Recommendations:

- Conduct a complete review of non-compliance activities and the subsequent actions and penalties
- Review the legislation concerned and make necessary amendments
- Review the current penalties and update as necessary
- Improve awareness and control of illegal animal movements of animals both between states and at international land borders
- Improve the implementation of legislation in the states

IV-3 International harmonisation *The authority and capability of the VS to be active in the international harmonisation of regulations and sanitary measures and to ensure that the national legislation and regulations under their mandate take account of relevant international standards, as appropriate.*	Levels of advancement
	1. National legislation, regulations and sanitary measures under the mandate of the VS do not take account of international standards.
	2. The VS are aware of gaps, inconsistencies or non-conformities in national legislation, regulations and sanitary measures as compared to international standards, but do not have the capability or authority to rectify the problems.
	3. The VS monitor the establishment of new and revised international standards, and periodically review national legislation, regulations and sanitary measures with the aim of harmonising them, as appropriate, with international standards, but do not actively comment on the draft standards of relevant intergovernmental organisations.
	4. The VS are active in reviewing and commenting on the draft standards of relevant intergovernmental organisations.
	5. The VS actively and regularly participate at the international level in the formulation, negotiation and adoption of international standards24, and use the standards to harmonise national legislation, regulations and sanitary measures.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SG15, Information from discussions with DADF

Findings:

The DADF routinely attend the OIE Annual General Session every May with a large delegation including industry representatives; in addition, DADF participate in some *ad hoc* OIE meetings, e.g. on working equines.

DADF monitor the establishment of new and revised international standards and periodically review national legislation, regulations and sanitary measures with the aim of harmonising these, as appropriate, with international standards. DADF do not actively comment on all the draft standards of relevant intergovernmental organisations but do so when it is considered important and relevant.

When there is an important point affecting a particular group, e.g. poultry, the relevant associations are sent the draft for comments and a meeting may take place. As a result, comments are sent to OIE for consideration. Sometimes administrative arrangements compromise this approach. For example, an OIE draft welfare chapter was sent to India for comment but was directed to the wrong department so little time was then available to adequately circulate the draft for comments, though a response was sent to OIE.

DADF (Trade department) attend some Codex Alimentarius meetings, e.g. veterinary medicines and residues with EIC, APEDA and the Ministry of Health (FSSAI has the lead). DADF are members of some of the “shadow committees” (e.g. food hygiene) set up internally where inputs are discussed and FSSAI then present at the Codex meetings. Participation is high in Codex as an APEDA representative is currently a Codex chairperson. India had significant input with the EU on the ban of bovine somatotropin.

DADF try to amend their legislation following establishment of new standards and amending when necessary. FSSAI stated that there is an on-going demand for review of the standards taking into account the latest development in food science, food consumption patterns, new specifications, presence of new contaminants and toxins, as well as the use of new food additives and ingredients. FSSAI review India’s standards and harmonise them with the Codex and other international best practices to the extent possible and necessary taking into account their needs – a significant number of standards have been developed.

[24] A country could be active in international standard setting without actively pursuing national changes. The importance of this element is to promote national change.

Strengths:

- Discuss issues with stakeholders if considered relevant and important
- Review new scientific standards and try to amend legislation if important enough and relevant
- Have an input and take part in OIE and Codex meetings
- Have a significant number of standards

Weaknesses:

- Do not always comment on draft standards
- Do not routinely harmonise all legislation to international standards
- Do not put any information concerning this topic on the DADF website

Recommendations:

- Comment on all relevant drafts
- Ensure all new international standards are reviewed and the legislation updated as necessary
- Provide information on draft international standards and comments sent to OIE/Codex from Government of India on the DADF website

IV-4 International certification[25] *The authority and capability of the VS to certify animals, animal products, services and processes under their mandate, in accordance with the national legislation and regulations, and international standards.*	Levels of advancement
	1. The VS have neither the authority nor the capability to certify animals, animal products, services or processes.
	2. The VS have the authority to certify certain animals, animal products, services and processes, but are not always in compliance with the national legislation and regulations and international standards.
	3. The VS develop and carry out certification programmes for certain animals, animal products, services and processes under their mandate in compliance with international standards.
	4. The VS develop and carry out all relevant certification programmes for any animals, animal products, services and processes under their mandate in compliance with international standards.
	5. The VS carry out audits of their certification programmes, in order to maintain national and international confidence in their system.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SM10, SM15, SM21, SKA27, SG11, SG16, SG18, SG19 and discussions with DADF staff.

Findings:

There are four main bodies responsible for International export certification in India; each certifying body has a well-defined role.

1. Quarantine and Certification Services

Certification for live animals and some specific animal products is undertaken by the Animal Quarantine and Certification Services (AQCS), part of the Department of Animal Husbandry (DADF). The conditions and testing requirements of the importing country for live animals are complied with by AQCS.

Some specific animal products, such as dog chews, ossein and gelatine, are also the responsibility of AQCS but in these cases CAPEXIL[26], a designated body of commerce that registers the processing establishment and authorises the licences for export. A joint certificate is issued one for quality by CAPEXIL and the other for animal health by AQCS. This system works well with the TRACES electronic certification system used by the EU[27].

2. Agriculture & Processed Food Products & Export Development Authority

The Agriculture & Processed Food Products & Export Development Authority (APEDA)[28] is responsible for red meat (buffalo, sheep and goat meat), poultry products, animal casings, milk and milk products and honey.

APEDA focuses on the development and promotion of exports of scheduled products. APEDA registers the exporting slaughterhouses and meat plants according to laid down standards and procedures; DADF is responsible for the associated animal health certification.

APEDA ensures coordination with various departments for meat exports, and monitors meat exports through its 'Meat-Net' (an online electronic animal health certificate issuance system); this system has been used by buffalo meat exporters for more than four years.

Each exporter and supervising State Veterinary Inspector has a unique access code to the 'Meat-Net' website. This ensures that export is only from an APEDA approved processing plant and within the agreed capacity of the company. Information on each consignment is uploaded and the State Veterinary Inspector signs the health certificate. Samples are taken from each batch of meat from the processing plant and tested at the on-site laboratory and then at the

[25] Certification procedures should be based on relevant OIE and Codex Alimentarius standards.
[26] https://www.capexil.com
[27] https://ec.europa.eu/food/animals/traces_en
[28] www.apeda.gov.in

port prior to export at the Mumbai State Department of Animal Husbandry laboratory. If all tests are negative the DAH laboratory state veterinarian countersigns the final Health Certificate for export.

The export certificate and the boxes of meat have bar codes which provides all the information related to the consignment, including which state and facility the meat was produced, inspected, tested and where the certificate was signed. All boxes and packages are labelled with the plant number resulting in good traceability.

The export certificate has a two-dimensional bar code which can be scanned using a phone and this is directly connected to Meat.Net and the certificate can be visualised. The stamp and the signature are in a different colour to the printing of the certificate to avoid the possibility of fraud.

The Export of Raw Meat, Chilled/Frozen, Rules, lays down the standards for abattoirs, meat processing plants and various meat product plants. These are registered by APEDA following a detailed inspection with experts from DADF, food processing, FSSAI, EIC, HACCP expert and representatives from the respective state AHD. Note that it is forbidden to export bone-in meat from India.

3. Export Inspection Council

The Indian Export Inspection Council (EIC)[29] is the regulatory body responsible for animal products established by the Export (Quality Control and Inspection) Act 1963 with the corresponding rules laid down in 1964. The EIC was set up to ensure sound development of export trade through quality control and inspection. It offers a fast and efficient 'e-Health' certification service for its exporters.

Products under mandatory inspection and certification by EIC include milk, egg, poultry meat, meat , processed meat, honey, gelatin, ossein, crushed bones and animal casings.

The EIC approves the processing establishment, approves the veterinarians employed by the establishments and assess the supplying farms, slaughterhouses, processing plants and poultry farms. Unannounced visits are carried out to assess and monitor withdrawal periods and animal health aspects. There is an annual plan. EIC testing and certification does not cover those aspects covered by APEDA but they work closely together.

The animal disease related declaration is based on attestation provided by DADF/AQCS (e.g. gelatine) certification by official veterinarians of EIC.

EIC carries out residue testing for detection of illegal treatments/abuse of substances in the production of food, compliance with the Maximum Residue Limits (MRL), for veterinary drugs and other pharmacologically active substances. This is carried out for dairy farms, layer farms, broiler farms and slaughterhouses. Samples of muscle, blood, skin with fat, organs, feed, raw milk, honey, and water, etc. are sent to their laboratories which are accredited to ISO 17025 and also ISO 17043 as an international proficiency test provider for veterinary drugs

4. Directorate General of Foreign Trade

Directorate General of Foreign Trade (DGFT) of the Ministry of Commerce and Industry processes proposals for import, export, manufacturing and marketing of livestock and products of animal origin including vaccines, medicines and biologicals. The technical opinion of DADF/AQCS are sent to the DGFT for issuance of the necessary export licence/permission after consideration by the 'Committee on Trade'.

No internal audits are carried out of the certification systems and procedures.

[29] www.eicindia.gov.in

Strengths

- Well established export certification process is working well
- Use of e-certificates and processes
- Informative websites

Weaknesses:

- Having up to five (AQCS, CAPEXIL, APEDA, EIC and DGFT) different bodies responsible for export certification of animals and animal products in the veterinary domain is rather confusing, e.g. for honey, milk products, etc.
- No internal audits are carried out

Recommendations:

- Review options for rationalising the need for different bodies responsible for export certification – consider giving overall export authority to the DADF/AQCS;
- Introduce internal audits of the certification systems and procedures

IV-5 Equivalence and other types of sanitary agreements *The authority and capability of the VS to negotiate, implement and maintain equivalence and other types of sanitary agreements with trading partners.*	Levels of advancement
	1. The VS have neither the authority nor the capability to negotiate or approve equivalence or other types of sanitary agreements with other countries.
	2. The VS have the authority to negotiate and approve equivalence and other types of sanitary agreements with trading partners, but no such agreements have been implemented.
	3. The VS have implemented equivalence and other types of sanitary agreements with trading partners on selected animals, animal products and processes.
	4. The VS actively pursue the development, implementation and maintenance of equivalence and other types of sanitary agreements with trading partners on all matters relevant to animals, animal products and processes under their mandate.
	5. The VS actively work with interested parties and take account of developments in international standards, in pursuing equivalence and other types of sanitary agreements with trading partners.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SG16, Annual Report 20016-7 and from discussions with DADF staff.

Findings:

Agreements have been reached with a number of countries concerning compartmentalisation for poultry, however there is no written formal agreement on compartmentalisation but importing countries accept them and conduct regular inspections and exports are taking place.

An equine disease free zone (EDFZ) was established in the RVC, Meerut, and approved by the EU for export of horses to participate in an international equestrian event in 2014. The same EDFZ was recognised by Indonesia in 2018 for the same purpose.

There have been some difficulties in exporting poultry and poultry products to some countries following outbreaks of AI when the whole country has been blocked. The Indian poultry industry have concerns as the guidelines in the OIE TAHC define the whole country disease status.

India has many agreements with individual countries (e.g. Canada, Brazil, Argentina, EU) on import requirements and health certification for imports and exports of animals and animal products. For buffalo meat APEDA carries out the negotiations but DADF agree to the final requirements and health certificates.

India was in negotiations with the EU on a SPS agreement but negotiations have been suspended for some time.

There are bilateral animal husbandry agreements with a number of countries or groups of countries including SAARC, ASEAN and BRICS.

The DADF is a regular member, fee paying, to the following international organisations or bodies: OIE, Animal Production and Health Commission for the Asia and Pacific, International Dairy Federation.

Strengths:

- Agreements with groups of countries on animal husbandry matters are in place
- Agreements concerning compartmentalisation for poultry and a disease free zone for horses currently in use
- Many agreements with individual countries on import requirements and health certification for imports of animals and animal products

Weaknesses:

- Lack of progress/agreement with importing countries on managing localised HPAI outbreaks in India

Recommendations:

- Seek formal written agreements with importing countries on compartmentalisation
- Negotiate agreements on the export of poultry and poultry products after localised HPAI outbreaks

IV-6 Transparency	Levels of advancement
The authority and capability of the VS to notify the OIE of its sanitary status and other relevant matters (and to notify the WTO SPS Committee where applicable), in accordance with established procedures.	1. The VS do not notify.
	2. The VS occasionally notify.
	3. The VS notify in compliance with the procedures established by these organisations.
	4. The VS regularly inform interested parties of changes in their regulations and decisions on the control of relevant diseases and of the country's sanitary status, and of changes in the regulations and sanitary status of other countries.
	5. The VS, in cooperation with their interested parties, carries out audits of their transparency procedures.

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): Discussions with DADF staff

Findings:

The VS usually notify OIE by submitting six-monthly reports on the notification of the presence of OIE listed diseases directly into the WAHIS database; however, the six-monthly report for the second half of 2017 has not yet been received. Only in cases of HPAI have immediate notifications been made to OIE. It is considered that outbreak information is likely to be missing for some diseases, e.g. TB and brucellosis (see also CCII-5B). Staff are assigned for all the OIE designated focal points.

Codex Alimentarius notifications are mainly handled by FSSAI, EIC, and APEDA with some input from DADF.

The main WTO-SPS contact point is in the Ministry of Commerce and Industry (MoCI) but there is also a secondary one in the Trade Department of DADF; DADF send notifications to their SPS colleague in MoCI who collates and forwards the draft notifications to the WTO-SPS committee. Notifications of changes to legislation are sent to the WTO-SPS committee including changes to animal health and production legislation (as notified by the DADF Trade Department).

The VS do not conduct any audit of their transparency procedures.

Due mainly to staff shortages, inspections or audits are not carried out in countries exporting to India. The VS, in cooperation with interested parties, do not carry out audits of the exporting country's transparency procedures.

The VS do not regularly inform interested parties of changes in their regulations and decisions on the control of relevant diseases and of the country's sanitary status, and of changes in the regulations and sanitary status of other countries.

Strengths:

- All OIE focal points are filled
- Trade department in DADF
- Changes in legislation usually notified

Weaknesses:

- Some deficiencies in outbreak reporting
- No inspections or audits in countries exporting animals and animal products to India
- No audits of transparency procedures
- No regular information provided to interested parties of changes in regulations and decisions on the control of relevant diseases and of the country's sanitary status or changes in the regulations and sanitary status of other countries.

Recommendations:

- Ensure 'immediate notification' to OIE of all outbreaks of epidemiological significance
- Ensure all new trade related legislation is sent to SPS committee
- Carry out inspections/audits/evaluations in countries exporting animals or animal products to India
- Introduce audits of the transparency procedures
- Inform partners of changes regulations and decisions on the control of relevant diseases and of the country's sanitary status or changes in the regulations and sanitary status of other countries regularly

IV-7 Zoning	Levels of advancement
The authority and capability of the VS to establish and maintain disease free zones, as necessary and in accordance with the criteria established by the OIE (and by the WTO SPS Agreement where applicable).	1. The VS cannot establish disease free zones.30
	2. As necessary, the VS can identify animal sub-populations with distinct health status suitable for zoning.
	3. The VS have implemented biosecurity measures that enable it to establish and maintain disease free zones for selected animals and animal products, as necessary.
	4. The VS collaborate with producers and other interested parties to define responsibilities and execute actions that enable it to establish and maintain disease free zones for selected animals and animal products, as necessary.
	5. The VS can demonstrate the scientific basis for any disease free zones and can gain recognition by trading partners that they meet the criteria established by the OIE (and by the WTO SPS Agreement where applicable).

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SM21, SK21, SG33, SUP1

Findings:

India has agreements with some trading partners based on low risk 'disease-free' zones. These zones are not widely recognised internationally. An 'Equine Disease Free Zone' (EDFZ) is recognised internationally.

Equine Disease Free Zone

An EDFZ was established in 2014 at the 'Remount and Veterinary Corps' (RVC), Meerut; this is the only disease free zone for horses in the country. This zone follows the OIE guidelines for the establishment of an EDFZ. The EDFZ consists of a 'Core Zone' within the RVC equestrian premises. It has an outer fence surrounding a training area and an inner fence surrounding the stable area. This core zone is continuously kept empty of horses. When India needs to send horses to participate in international events (e.g. Asian Games in Indonesia, 2018), the horses are introduced to the core zone for a period of 90 days and are kept in total isolation. A biosecurity manual lays down the measures to be applied. The Core Zone is surrounded by a 10km 'Surveillance Zone' in which 10% of the horses are sampled for equine infectious anaemia and glanders. A second perimeter is set at 25km and in this area 5% of horses (includes also mules and donkeys) are tested. Regular surveillance is carried out and entry into the Surveillance Zone is controlled. The EDFZ is managed by the Remount and Veterinary Services (RVS) in close collaboration with the AHD of Uttar Pradesh. The EDFZ is audited regularly by RVS Headquarters, Delhi, in collaboration with DADF and the state AHD. An official declaration of the EDFZ is issued by the Principal Secretary AHD of Uttar Pradesh. The EDFZ was accepted bilaterally by Korea in 2014 and by Indonesia in 2018; an application for recognition of the EDFZ with the EU is under way.

FMD Zone

Trading partners accept buffalo meat from approved export slaughterhouses and also semen. These enterprises receive certificates from state AHDs that they are located in FMD, RP and anthrax 'free zones'. In this context for the bull semen stations, 'free zones' refers only to the surrounding district where enhanced surveillance and FMD vaccination is carried out; for buffalo meat exports the 'free zone' is broader and covers the districts supplying the animals in the self-assessed FMD free states. These disease-free zones do not currently comply with the OIE definition of zoning. Progress has been made in FMD control and there is a desire to comply with the OIE standards. An application for the recognition of three FMD-free zones with

[30] If the VS has the authority and capability but chooses not to implement zoning, this CC should be recorded as "not applicable at this stage"

vaccination was submitted to the OIE in 2016 for Telangana and Andhra Pradesh (Zone 1), Maharashtra (Zone 2) and Punjab (Zone 3).

It is understood that an OIE mission team is due to visit India in mid-2018 to assess the progress of the FMD-CP.

The application for recognition of FMD freedom follows the guidelines of Chapter 8.8.3 and the questionnaire (1.6.6) of the TAHC and is based on the main principles of no disease occurrence of any FMD outbreak for at least two years and protection of the zone by natural boundaries, implementation of FMD vaccination and control in neighbouring states, and well controlled animal movement with supporting legislation in place. The application is based on the success of the FMD-CP, as described in CC II-7, which has been implemented in a phased approach and in the three zones since 2006/07.

In addition to the usual FMD-CP activities, additional measures are being undertaken in the intended free zones including:

1. Ring vaccination of all susceptible species in a 5km radius in the event of an outbreak
2. Testing and quarantine of new animals before introduction
3. Monitoring of small ruminants for virus transmission
4. Monitoring of livestock markets and fairs
5. Monitoring of livestock movement from one district to another, also during fairs and religious festivals

It was not clear to the mission that all such measures were yet in place.

Strengths:

- The state AHDs support the private sector meat exporters and government semen stations by undertaking disease surveillance and disease control around the establishments
- The EDFZ is set up in full compliance with OIE guidelines and disease surveillance is carried out following a strict protocol
- No glanders cases have been detected in the EDFZ, although the state in which it is located has the highest number of glanders cases

Weaknesses:

- The pre-export isolation time of 90 days in the EDFZ is long compared to 30 days as per international quarantine requirements for glanders and importing countries requirements
- Given the large number of sport horses having only one EDFZ in the north of the country, where it is very hot during the summer months, is insufficient
- Limited movement control across state borders into the three proposed FMD-free zones
- Limited FMD surveillance in wildlife and small ruminants in the proposed FMD-free zones

Recommendations:

- DADF working with the Uttar Pradesh AHD should make a self-declaration for the EDFZ with OIE
- Establish additional EDFZ zones in states free from glanders for sport horses; this is particularly applicable to states that have not experienced outbreaks for many years (e.g. Karnataka) and have substantial number of sport horses
- Reduce the pre-export isolation time in the EDFZ to 30 days as per international quarantine requirements for glanders and importing countries requirements
- Introduce mandatory ear tagging and animal health cards in the three zones proposed as FMD-free with vaccination
- Intensify FMD surveillance in all susceptible species within the proposed FMD-free zones

IV-8 Compartmentalisation	Levels of advancement
The authority and capability of the VS to establish and maintain disease free compartments as necessary and in accordance with the criteria established by the OIE (and by the WTO SPS Agreement where applicable).	1. The VS cannot establish disease free compartments.31
	2. As necessary, the VS can identify animal sub-populations with a distinct health status suitable for compartmentalisation.
	3. The VS ensure that biosecurity measures to be implemented enable it to establish and maintain disease free compartments for selected animals and animal products, as necessary.
	4. The VS collaborate with producers and other interested parties to define responsibilities and execute actions that enable it to establish and maintain disease free compartments for selected animals and animal products, as necessary.
	5. The VS can demonstrate the scientific basis for any disease free compartments and can gain recognition by other countries that they meet the criteria established by the OIE (and by the WTO SPS Agreement where applicable).

Terrestrial Code reference(s): Appendix 1

Evidence (listed in Appendix 5): SM8, SM9

Findings:

Disease-free, high-health poultry compartments have been accepted by trading partners. There are currently 28 approved poultry compartments in India.

The recognition process of the compartment status is clearly defined. Maintenance of recognition is subject to biannual (six monthly) inspection by the state department, following a check list, and using a prescribed surveillance programme every three months. The initial approval is given for one year, based on satisfactory results of the inspections, it can then be renewed for three years. Trading partners have undertaken inspections and given their approval, however, this is not clearly documented. Trading partners conduct annual inspections to renew their trade agreement.

Such compartments may continue to export if AI is confirmed in the country or the state provided there is no outbreak within a 1 km radius of the farm. To reduce the risk from the surrounding poultry farms, the companies integrate these farms by supplying day-old chicks and providing technical assistance. If an outbreak occurs within the 1km zone, all the birds in the compartment would have to be culled.

There are SOPs for all procedures and a vaccination chart for bird management. Biosecurity measures are of very high standard with separation of production zones within the farm, clear routing of people and materials, different colour coding of people and materials, etc. The compartments follow the OIE checklist for biosecurity measures in a compartment.

Companies carry out their own routine serological surveillance every 6 weeks and in addition samples are sent to the state laboratory every three months with the state checking the sampling procedure every six months. Tests include AI, ND and salmonella.

Specific measures taken by most of the poultry compartments include:

1. Secure main gate with full vehicle pressure wash and wheel dips
2. Complete clothing change and wash with initial disinfectant spray
3. Separate entry gate with disinfectant for each poultry zone
4. Dedicated delivery vehicles for transport; cleansing and disinfection of lorries before transport.
5. Perimeter fence - dog proof
6. Separation of different sheds with rodent control and bird proofing
7. Vegetation cleared around sheds.

[31] If the VS has the authority and capability but chooses not to implement compartmentalization, this CC should be recorded as “not applicable at this stage”

8. Separate feed store; feed arrives double bagged and only enters the compartment after removal of the outer bag and fumigation of the inner bag
9. Extensive one-month cleaning programme followed by 1.5 months rest period prior to restocking
10. Incineration of dead birds
11. Own lorry for removal of manure to perimeter then taken for onward delivery by an outside vehicle
12. Staff not allowed to keep their own poultry; staff have regular medical checks

Strengths:

- International trading partners recognise poultry compartments
- Production companies further mitigate risk by working with surrounding farmers
- Good state collaboration – biosafety measures supervised and assessed by the state veterinary services

Weaknesses:

- Documented approval by trading partners is required
- Need to increase health monitoring of surrounding area

Recommendations:

- Continue to increase the number of recognised compartments as appropriate
- Ensure documentation is provided of official recognition from trading partners
- Increase monitoring of poultry in the surrounding areas

PART IV: CONCLUSIONS

The India PVS Evaluation was the most complex of any yet undertaken by OIE and presented many challenges. OIE recognised this challenge and worked with the excellent support of the Indian authorities, both national and state, to address the many issues.

India is a vast country, a true sub-continent, with a huge range of cultural, ethnic, linguistic and economic diversity. As a federation much of India's animal health and veterinary public health services are provided by the diverse array of 29 states and seven Union Territories. Compounding these challenges further is that India has the second largest human population in the world and very large livestock and poultry populations, much of which is managed by smallholder operations.

The OIE PVS Evaluation is an assessment of the national VS of India and not of the subnational state programmes. This evaluation was not able to provide direct feedback for the individual jurisdictions visited. It is strongly recommended that this national be followed up by assessment of individual state veterinary services.

To address this complexity, the PVS Evaluation mission was unique in its set up and implementation: a preparatory PVS training was provided for DADF and all the states (August 2017) and this was followed up by intensive preparation by all Indian governments (central and state) including self-assessment by external agents, and the formal external OIE PVS Evaluation was run as two three-week missions (February/March and April/May 2018). Further the evaluation was implemented by four of the most senior and experienced OIE PVS experts and was also accompanied by two OIE observers.

India central and state governments were fully committed to the PVS Evaluation and were very well prepared for the mission with extensive briefing materials prepared beforehand. A comprehensive programme of meetings, interviews and visits allowed a sound understanding of the very extensive Indian Veterinary Services.

The evaluation mission team visited key agencies and places and held discussions with many stakeholders specifically MoA&FW (DADF and its associated departments and groups, ICAR and NDDB) and national government agencies particularly MoH&FW (FSSAI, CDSCO, CDC) and MoEFCC (AWBI). Importantly there was also useful interaction with private sector companies, NGOs and producer associations. These activities were mirrored at the state level.

Notwithstanding the above comments there were some limitations to the Evaluation. Although the team travelled extensively there was insufficient time to visit more remote areas, including ethnic minority areas, and although 22 states were visited of the 29 there were some key absences including major livestock states with international borders (Bihar and West Bengal) and of smaller less accessible states and/or those with security concerns (Jammu & Kashmir, Sikkim, Arunachal Pradesh, Nagaland and Manipur); of the seven UTs only Delhi and Chandigarh were visited.

Overall it can be concluded that the PVS Evaluation mission completed a valid assessment of the Veterinary Services of India.

India has a very large and diverse livestock economy with a remarkable growth record; policy support is strong for the continuing growth of the agricultural sector including livestock. Most of India's livestock production continues to come from small rural owners with few animals managed extensively but there is increasing application of extension services and technologies to promote the productivity and sustainability of this sector. There is also increasing livestock production through medium and large sized enterprises, particularly for poultry. All sectors of the livestock and poultry industries recognise the importance of animal health for efficient and profitable production.

In India most of the livestock and poultry production is consumed domestically but export markets are increasing and expected to increase further. Exports include live animals, animal products and also veterinary medicines and biologicals; these are being exported to more than 70 countries. India imports only very limited quantities of animals and animal products.

India has faced and continues to face a number of major transboundary animal diseases including particularly FMD, PPR, CSF, PRRS and HPAI; it also faces a number of serious endemic diseases such as anthrax, HS, BQ, brucellosis, glanders, ND and other poultry diseases. Various disease control programmes are being implemented. HPAI outbreaks have been effectively controlled but have resulted in export market disruption. It was noted that international trading partners recognise poultry compartments in India – one of very few countries where this has been achieved. Trade in de-boned and de-glanded buffalo meat is mostly to FMD infected countries but export markets may be closed if this disease increases dramatically.

Overall the assessment of the VS of India against OIE standards is that they operate at a variable level with some great strengths and unique approaches but also some significant limitations; there are opportunities for improvement.

As a federal country the Indian VS are delivered primarily at state level; nationally DADF provides technical leadership, manages border controls and international relations. The Indian VS have very large staff numbers with many veterinarians and veterinary para-professionals employed particularly by the states. Veterinarians meet national Day 1 competencies and many have postgraduate qualifications, however there are major limitations in some specialist areas such as epidemiology, risk analysis and food safety. Veterinary para-professionals form a very large part of the field service but with a much more variable standard. There are concerns about the lack of sufficient veterinary supervision of the veterinary para-professionals.

The VS generally have adequate physical resources with suitable offices, transport and equipment; repairs and maintenance is problematic. There is an extensive national network of diagnostic laboratories from simple bench top analysis at the district or local levels through more sophisticated SDDLs and C/RDDLs to international standard specialist reference laboratories. The laboratory network is well used.

The VS field programmes have been established for disease surveillance and control for a number of key diseases. Disease surveillance is limited by insufficient field coverage by veterinarians and veterinary para-professionals, limited sample collection and diagnostic testing, the limitations of the NADRS information management system and the lack of critical analysis and review. The effectiveness of disease control is restricted by an overreliance on vaccination and inadequate emphasis on mitigating other risk factors such as public awareness, little or limited animal movement control with lack of adequate animal ID and poor biosecurity; there is a need to review of the effectiveness and efficiency of disease control programmes.

Emergency response has been effective against a series of HPAI outbreaks. Although effective the emergency responses are not being critically reviewed or revised. Joint Rapid Response Teams have been developed between health and animal health and this is an excellent step in promoting coherent One Health investigations.

Food safety is highly variable with best practice operations for export and major domestic suppliers but less effective management at municipal slaughterhouses and no control of smaller operations and of the ubiquitous chicken shops.

The control of zoonoses is limited by the lack of formal communication and coordination between the health and animal health sectors. Rabies remains largely uncontrolled in rural areas with the emphasis from the health sector being on post exposure prophylaxis rather than more logical investment of controlling the disease in dogs. Other zoonoses also remain a

concern including diseases such as leptospirosis, brucellosis, cysticercosis, influenza, anthrax and most recently Nipah disease.

Welfare is a very important issue in India. Culturally India has a huge respect for animals and their well-being and this is demonstrated by the care that is provided by the government through the heavily subsidised field veterinary service. Euthanasia although legally possible is generally not accepted in India and this can lead to moribund, diseased, disabled animals, particularly cattle, dying a slow death.

This PVS Evaluation mission is an important step in assessing the level of advancement of a national VS against internationally endorsed OIE standards. India is complemented in undertaking this assessment.

PART V: APPENDICES

Appendix 1: Terrestrial Code references for critical competencies

Critical Competences	Terrestrial Code references
I.1.A **I.1.B** **I.2.A** **I.2.B**	➢ Points 1-5 of Article 3.1.2. on Fundamental principles of quality: Professional judgement / Independence / Impartiality / Integrity / Objectivity. ➢ Points 7 and 14 of Article 3.1.2. on Fundamental principles of quality: General organisation / Human and financial resources. ➢ Article 3.2.5. on Evaluation criteria for human resources. ➢ Article 3.2.12. on Evaluation of the veterinary statutory body. ➢ Points 1-2 and 5 of Article 3.2.14. on Organisation and structure of Veterinary Services / National information on human resources / Laboratory services.
I.3	➢ Points 1, 7 and 14 of Article 3.1.2. on Fundamental principles of quality: Professional judgement / General organisation / Human and financial resources. ➢ Article 3.2.5. on Evaluation criteria for human resources. ➢ Sub-point d) of Point 4 of Article 3.2.10. on Veterinary Services administration: In-service training and development programme for staff. ➢ Point 9 of Article 3.2.14. on Performance assessment and audit programmes.
I.4	➢ Point 2 of Article 3.1.2. on Fundamental principles of quality: Independence.
I.5	➢ Point 1 of Article 3.2.3. on Evaluation criteria for the organisational structure of the Veterinary Services. ➢ Point 9 of Article 3.2.14. on Performance assessment and audit programmes.
I.6.A **I.6.B**	➢ Points 6, 7 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General organisation / Procedures and standards. ➢ Article 3.2.2. on Scope. ➢ Points 1 and 2 of Article 3.2.3. on Evaluation criteria for the organisational structure of the Veterinary Services. ➢ Point 4 of Article 3.2.10. on Performance assessment and audit programmes: Veterinary Services administration.
I.7	➢ Point 2 of Article 3.2.4. on Evaluation criteria for quality system: “Where the Veterinary Services undergoing evaluation… than on the resource and infrastructural components of the services”. ➢ Points 2 and 3 of Article 3.2.6. on Evaluation criteria for material resources: Administrative / Technical. ➢ Point 3 of Article 3.2.10. on Performance assessment and audit programmes: Compliance. ➢ Point 4 of Article 3.2.14. on Administration details.
I.8 **I.9** **I.10**	➢ Points 6 and 14 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / Human and financial resources. ➢ Point 1 of Article 3.2.6. on Evaluation criteria for material resources: Financial. ➢ Point 3 of Article 3.2.14. on Financial management information.
I.11	➢ Points 7, 11 and 14 of Article 3.1.2. on Fundamental principles of quality: General organisation / Documentation / Human and financial resources. ➢ Point 4 of Article 3.2.1. on General considerations. ➢ Point 1 of Article 3.2.2. on Scope. ➢ Article 3.2.6. on Evaluation criteria for material resources. ➢ Article 3.2.10. on Performance assessment and audit programmes.
II.1A **II.1B** **II.2**	➢ Point 9 of Article 3.1.2. on Fundamental principles of quality: Procedures and standards. ➢ Point 1 of Article 3.2.4. on Evaluation criteria for quality systems. ➢ Point 3 of Article 3.2.6. on Evaluation criteria for material resources: Technical. ➢ Point 5 of Article 3.2.14. on Laboratory services.
II.3	➢ Chapter 2.1. on Import risk analysis
II.4	➢ Points 6 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / Procedures and standards.

	➢ Point 2 of Article 3.2.7. on Legislation and functional capabilities: Export/import inspection. ➢ Points 6 and 7 of Article 3.2.14. on Veterinary legislation, regulations and functional capabilities / Animal health and veterinary public health controls.
II.5.A **II.5.B**	➢ Points 6, 7 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General organisation / Procedures and standards. ➢ Points 1-3 of Article 3.2.8. on Animal health controls: Animal health status / Animal health control / National animal disease reporting systems. ➢ Sub-points a) i), ii) and iii) of Point 7 of Article 3.2.14. on Animal health: Description of and sample data from any national animal disease reporting system controlled and operated or coordinated by the Veterinary Services / Description of and sample reference data from other national animal disease reporting systems controlled and operated by other organisations which make data and results available to Veterinary Services / Description and relevant data of current official control programmes including:… or eradication programmes for specific diseases. ➢ Chapter 1.4. on Animal health surveillance. ➢ Chapter 1.5. on Surveillance for arthropod vectors of animal diseases.
II.6	➢ Points 6, 7 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General organisation / Procedures and standards. ➢ Points 1-3 of Article 3.2.8. on Animal health controls: Animal health status / Animal health control / National animal disease reporting systems. ➢ Sub-point a) of Point 7 of Article 3.2.14. on Animal health and veterinary public health controls: Animal health.
II.7	➢ Points 6, 7 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General organisation / Procedures and standards. ➢ Points 1-3 of Article 3.2.8. on Animal health controls: Animal health status / Animal health control / National animal disease reporting systems. ➢ Sub-point a) of Point 7 of Article 3.2.14. on Animal health and veterinary public health controls: Animal health. ➢ Chapter 4.12. on Disposal of dead animal.
II.8.A **II.8.B** **II.8.C**	➢ Points 6, 7 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General organisation / Procedures and standards. ➢ Article 3.4.12. on Human food production chain. ➢ Points 1-5 of Article 3.2.9. on Veterinary public health controls: Food hygiene / Zoonoses / Chemical residue testing programmes / Veterinary medicines/ Integration between animal health controls and veterinary public health. ➢ Points 2, 6 and 7 of Article 3.2.14. on National information on human resources / Veterinary legislation, regulations and functional capabilities / Animal health and veterinary public health controls. ➢ Chapter 6.2. on Control of biological hazards of animal health and public health importance through ante- and post-mortem meat inspection. References to Codex Alimentarius Commission standards: ➢ Code of Hygienic practice for meat (CAC/RCP 58-2005). ➢ Code of Hygienic practice for milk and milk products (CAC/RCP/ 57-2004). ➢ General Principles of Food Hygiene (CAC/RCP 1-1969; amended 1999. Revisions 1997 and 2003).
II.9	➢ Points 6 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / Procedures and standards. ➢ Points 3 and 4 of Article 3.2.9. on Veterinary public health controls: Chemical residue testing programmes / Veterinary medicines. ➢ Sub-point a) ii) of Point 6 of Article 3.2.14. on Animal health and veterinary public health: Assessment of ability of Veterinary Services to enforce legislation. ➢ Chapters 6.6. to 6.10. on Antimicrobial resistance.
II.10	➢ Points 3 and 4 of Article 3.2.9. on Veterinary public health controls: Chemical residue testing programmes / Veterinary medicines. ➢ Sub-points b) iii) and iv) of Point 7 of Article 3.2.14. on Veterinary public health: Chemical residue testing programmes / Veterinary medicines.
II.11	➢ Chapter 6.3. on Control of hazards of animal health and public health importance in animal feed.
II.12.A **II.12.B**	➢ Point 6 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation. ➢ Chapter 4.1. on General principles on identification and traceability of live animals.

	➢ Chapter 4.2. on Design and implementation of identification systems to achieve animal traceability.
II.13	➢ Section7 on Animal Welfare
III.1	➢ Point 13 of Article 3.1.2. on Fundamental principles of quality: Communication. ➢ Sub-point b) of Point 2 of Article 3.2.6. on Administrative resources: Communications. ➢ Point 4 of Article 3.2.14. on Administration details. ➢ Chapter 3.3. on Communication.
III.2	➢ Point 13 of Article 3.1.2. on Fundamental principles of quality: Communication. ➢ Point 2 of Article 3.2.3. on Evaluation criteria for the organisational structure of the Veterinary Services. ➢ Point 4 and Sub-point g) of Point 9 of Article 3.2.14. on Administration details and on Sources of independent scientific expertise. ➢ Chapter 3.3. on Communication.
III.3	➢ Article 3.2.11. on Participation on OIE activities. ➢ Point 4 of Article 3.2.14. on Administration details.
III.4	➢ Points 6, 7 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General organisation / Procedures and standards. ➢ Point 7 of Article 3.2.3. on Evaluation criteria for the organisational structure of the Veterinary Services. ➢ Article 3.4.5. on Competent Authorities.
III.5.A **III.5.B**	➢ Point 6 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation. ➢ Point 9 of Article 3.2.1. on General considerations. ➢ Article 3.2.12. on Evaluation of the veterinary statutory body. ➢ Article 3.4.6. on Veterinarians and veterinary para-professionals.
III.6	➢ Points 6 and 13 of Article 3.1.2. Fundamental principles of quality: Veterinary legislation / Communication. ➢ Points 2 and 7 of Article 3.2.3. on Evaluation criteria for the organisational structure of the Veterinary Services. ➢ Point 7 of Article 3.2.14. on Animal health and veterinary public health controls. ➢ Point 4 of Article 3.4.3. on General principles: Consultation.
IV.1	➢ Points 6, 7 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General organisation / Procedures and standards. ➢ Points 1 and 2 of Article 3.2.7. on Legislation and functional capabilities: Animal health, animal welfare and veterinary public health / Export/import inspection. ➢ Point 6 of Article 3.2.14. on Veterinary legislation, regulations and functional capabilities. ➢ Chapter 3.4. on Veterinary legislation.
IV.2	➢ Points 6, 7 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General organisation / Procedures and standards. ➢ Points 1 and 2 of Article 3.2.7. on Legislation and functional capabilities: Animal health, animal welfare and veterinary public health / Export/import inspection. ➢ Point 6 of Article 3.2.14. on Veterinary legislation, regulations and functional capabilities.
IV.3	➢ Point 6 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation. ➢ Article 3.2.11. on Participation in OIE activities. ➢ Points 6 and 10 of Article 3.2.14. on Veterinary legislation, regulations and functional capabilities / Membership of the OIE.
IV.4	➢ Points 6, 7 and 9 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General organisation / Procedures and standards. ➢ Point 2 of Article 3.2.7. on Legislation and functional capabilities: Export/import inspection. ➢ Sub-point b) of Point 6 of Article 3.2.14. on Veterinary legislation, regulations and functional capabilities: Export/import inspection. ➢ Chapter 5.2. on Certification procedures. ➢ Chapters 5.10. to 5.12. on Model international veterinary certificates.
IV.5	➢ Points 6 and 7 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation / General organisation. ➢ Sub-point g) of Point 4 of Article 3.2.10. on Veterinary Services administration: Trade performance history. ➢ Chapter 5.3. on OIE procedures relevant to the Agreement on the Application of Sanitary and Phytosanitary Measures of the World Trade Organization.

IV.6	➢ Point 6 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation. ➢ Points 1 and 3 of Article 3.2.8. on Animal health controls: Animal health status / National animal disease reporting systems. ➢ Chapter 5.1. on General obligations related to certification.
IV.7 **IV.8**	➢ Point 6 of Article 3.1.2. on Fundamental principles of quality: Veterinary legislation. ➢ Chapter 4.3. on Zoning and compartmentalisation. ➢ Chapter 4.4. on Application of compartmentalisation.

Appendix 2: Glossary of terms

Terms defined in the Terrestrial Code that are used in this publication are reprinted here for ease of reference.

Animal

means a mammal, bird or bee.

Animal identification

means the combination of the identification and registration of an animal individually, with a unique identifier, or collectively by its epidemiological unit or group, with a unique group identifier.

Animal identification system

means the inclusion and linking of components such as identification of establishments/owners, the person(s) responsible for the animal(s), movements and other records with animal identification.

Animal welfare

means how an animal is coping with the conditions in which it lives. An animal is in a good state of welfare if (as indicated by scientific evidence) it is healthy, comfortable, well nourished, safe, able to express innate behaviour, and if it is not suffering from unpleasant states such as pain, fear and distress. Good animal welfare requires disease prevention and veterinary treatment, appropriate shelter, management, nutrition, humane handling and humane slaughter/killing. Animal welfare refers to the state of the animal; the treatment that an animal receives is covered by other terms such as animal care, animal husbandry, and humane treatment.

Border post

means any airport, or any port, railway station or road check-point open to international trade of commodities, where import veterinary inspections can be performed.

Compartment

means an animal subpopulation contained in one or more establishments under a common biosecurity management system with a distinct health status with respect to a specific disease or specific diseases for which required surveillance, control and biosecurity measures have been applied for the purposes of international trade.

Competent Authority

means the Veterinary Authority or other Governmental Authority of a Member, having the responsibility and competence for ensuring or supervising the implementation of animal health and welfare measures, international veterinary certification and other standards and recommendations in the Terrestrial Code and the OIE Aquatic Animal Health Code in the whole territory.

Disease

means the clinical and/or pathological manifestation of infection.

Emerging disease

means a new infection or infestation resulting from the evolution or change of an existing pathogenic agent, a known infection or infestation spreading to a new geographic area or population, or a previously unrecognised pathogenic agent or disease diagnosed for the first time and which has a significant impact on animal or public health.

Equivalence of sanitary measures

means the state wherein the sanitary measure(s) proposed by the exporting country as an alternative to those of the importing country, achieve(s) the same level of protection.

International veterinary certificate

means a certificate, issued in conformity with the provisions of Chapter 5.2., describing the animal health and/or public health requirements which are fulfilled by the exported commodities.

Laboratory

means a properly equipped institution staffed by technically competent personnel under the control of a specialist in veterinary diagnostic methods, who is responsible for the validity of the results. The Veterinary Authority approves and monitors such laboratories with regard to the diagnostic tests required for international trade.

Meat

means all edible parts of an animal.

Notifiable disease

means a disease listed by the Veterinary Authority, and that, as soon as detected or suspected, must be brought to the attention of this Authority, in accordance with national regulations.

Official control programme

means a programme which is approved, and managed or supervised by the Veterinary Authority of a country for the purpose of controlling a vector, pathogen or disease by specific measures applied throughout that country, or within a zone or compartment of that country.

Official Veterinarian

means a veterinarian authorised by the Veterinary Authority of the country to perform certain designated official tasks associated with animal health and/or public health and inspections of commodities and, when appropriate, to certify in conformity with the provisions of Chapters 5.1. and 5.2. of the Terrestrial Code.

Official veterinary control

means the operations whereby the Veterinary Services, knowing the location of the animals and after taking appropriate actions to identify their owner or responsible keeper, are able to apply appropriate animal health measures, as required. This does not exclude other responsibilities of the Veterinary Services e.g. food safety.

Risk analysis

means the process composed of hazard identification, risk assessment, risk management and risk communication.

Risk assessment

means the evaluation of the likelihood and the biological and economic consequences of entry, establishment and spread of a hazard within the territory of an importing country.

Risk management

means the process of identifying, selecting and implementing measures that can be applied to reduce the level of risk.

Sanitary measure

means a measure, such as those described in various Chapters of the Terrestrial Code, destined to protect animal or human health or life within the territory of the OIE Member from risks arising from the entry, establishment and/or spread of a hazard.

Surveillance

means the systematic ongoing collection, collation, and analysis of information related to animal health and the timely dissemination of information so that action can be taken.

Terrestrial Code

means the OIE Terrestrial Animal Health Code.

Veterinarian

means a person with appropriate education, registered or licensed by the relevant veterinary statutory body of a country to practice veterinary medicine/science in that country.

Veterinary Authority

means the Governmental Authority of an OIE Member, comprising veterinarians, other professionals and para-professionals, having the responsibility and competence for ensuring or supervising the implementation of animal health and welfare measures, international veterinary certification and other standards and recommendations in the Terrestrial Code in the whole territory.

Veterinary) legislation

means the collection of specific legal instruments (primary and secondary legislation) required for the governance of the veterinary domain.

Veterinary para-professional

means a person who, for the purposes of the Terrestrial Code, is authorised by the veterinary statutory body to carry out certain designated tasks (dependent upon the category of veterinary para-professional) in a territory and delegated to them under the responsibility and direction of a veterinarian. The tasks for each category of veterinary para-professional should be defined by the veterinary statutory body depending on qualifications and training, and according to need.

Veterinary Services

means the governmental and non-governmental organisations that implement animal health and welfare measures and other standards and recommendations in the Terrestrial Code and the OIE Aquatic Animal Health Code in the territory. The Veterinary Services are under the overall control and direction of the Veterinary Authority. Private sector organisations, veterinarians, veterinary paraprofessionals or aquatic animal health professionals are normally accredited or approved by the Veterinary Authority to deliver the delegated functions.

Veterinary statutory body

means an autonomous regulatory body for veterinarians and veterinary para-professionals.

Wildlife

means feral animals, captive wild animals and wild animals.

Zoonosis

means any disease or infection which is naturally transmissible from animals to humans.

Appendix 3: Timetable of the mission; sites/ facilities visited and list of resource/contact persons met or interviewed

The OIE PVS Evaluation mission of India met many, many people and visited many places. It has not been possible to record the names of all those who contributed to our mission – please accept our apologies for the omissions. We are extremely grateful for the input from all those we met.

Mission 1		
Date	**Name of the Institute**	**Key persons met**
DADF - whole team		
19/2/18	DADF initial meeting	Dr Suresh Honnappagol, AHC
		Dr Praveen Malik, Director CCSNIAH
		Deputy and Assistant Commissioners & Livestock Officers of DADF
Delhi: Team A - Howard Batho & John Woodford		
20/2/18	Veterinary Hospital, Palam	Dr. J.K. Gaur, Director AH Delhi
		Dr. Nitant Paunikar, DAHO, Delhi
		Dr. L.C. Das, Deputy Director
		Dr. Satish Dabas, Veterinary Officer
	Farmer Information Training Centre Palam	Dr. K.K Sharma, Veterinary Officer
	District Diagnostic Lab	Dr. Satya Balasundaram, Veterinary Officer
	Niti Bagh Pet Clinic (Private)	Dr. Pradeep Rana, Veterinarian
	Delhi Society for Prevention of Cruelty to	Dr. Ubed Khan,
	Ghazipur, NDMC Slaughter House	Dr. P. Khokkar, Director, NDMC
		Dr. Harilal, Consultant
21/2/18	48 Military Veterinary Hospital, Under Indian	Dr. (Col). Amit Kumar, Director (Tech), Remount Veterinary
		Dr. (Col). C M Desai, Commandant Veterinary Hospital
		Dr. Adhiraj Mishra, Livestock Officer, DADF
	44 Military Veterinary Hospital, (RVC)	Dr. (Col). Amit Kumar, Director (Tech), Remount Veterinary
	Presidents Body Guard	Dr. (Col). K Atri, Commandant Veterinary Hospital
		Dr. Adhiraj Mishra, Livestock Officer, DADF
	Animal Quarantine Certification Service,	Dr. Vijay Kumar, Regional Officer, AQCS
	Kapashera, Delhi	Dr. Anirban Guha, Livestock Officer, DADF
Haryana-Hisar: Team B - Susanne Munstermann, John Weaver & Caitlin Holley		
20/2/18	Semen Bank Hisar,	Dr. S.K. Bagoria, Chief Superintendent G.L.F Hisar
		Sunil Kumar, Semen Bank Officer Hisar
		Dr. Virender Rathee, Semen Bank Officer Hisar
	Trainer's Training Institute, Hisar	Dr. B.S.Laura, Principal, TTI Hisar
		Dr. S.K. Soni, Master Trainer, TTI Hisar
		Dr. R.K. Sindhu, Master Trainer, TTI Hisar
	Central Institute for Research on Buffaloes	Dr. Inder Jeet Singh, Director CIRB Hisar
	Hisar	Dr. S.S. Dahiya,Principal Scientist CIRB
		Dr. Ashok Bhura, Senior Scientist CIRB Hisar
	Lala Lajpat Rai University of Veterinary &	Dr. P.K. Kapoor, Director Research Luvas Hisar
	Animal Sciences, Hisar	Dr. N.K. Mahajan, Dean, Luvas
		Dr. N.K.Jindal, Epidemiologist/Principal Scientist, Luvas
		Dr. Suresh Kumar,
		Dean IVPS Luvas
	Shri Hariana Kurukshetra Gaushala, Hisar	Dr. Moti Lal Sharma, Deputy Director Hisar
		Dr. Mahavir Godara, Vety. Surgeon
		Sh. Rajender Garg, Member Gaushala Society

21/2/18	Veterinary Pharmacy Chabbra Medical Hall, Hisar	Mr. Sada Nand Chabbra
	Lala Lajpat Rai University of Veterinary & Animal Sciences, Hisar	Dr. Gurdial Singh
		Sh. M.P. Kulshreshtha
	N.I.C. Unit, Hisar	Sh. Akhilesh Kumar
	ICAR-National Research Centre on Equine Hisar	Dr B. N Tripathi, Director, National Research Centre on Equine Hisar (9416600475; bntripathi1@yahoo.co.in)
		Dr Sanjay Kumar, Pr Scientist (Piro lab)
		Dr Harisankar Singha, Scientist (Glanders lab)
		Dr Nitin Virmani, Pr Scientist (Eq Influenza lab)
		All scientists
	National Centre on Veterinary Type Culture	Dr Sanjay Barua, Pr Scientist and others
		Dr. Moti Lal Sharma
		Deputy Director (AH), Hisar
		Dr Sanjay Kumar
Uttar Pradesh, Meerut: Team A - Howard Batho and Susanne Munstermann		
22/2/18	**Meerut Cantt, Meerut**	Maj Gen Anil Rana, SM, Commandant
	RVC Centre & College, EDFZ, 32 Mil Vet Hospital	Brig Bapu Paresanalli, Dy Commandant
	Central Military Veterinary Laboratory	Col Mangal Singh, OIC, EDFZ
		Col Amit Kumar, Director (Technical), Dte Gen of RVS, New Delhi
		Col V K Mudgal, Trg College
	Integrated Slaughter House and Processing Plant	Dr Sanjay Kumar, Veterinary Officer
	(M/s Al Faheem Meatex Pvt Ltd.)	Dr S K Srivastava, Additional Director (Animal Husbandry), Meerut
		Dr A K Singh, Chief Veterinary Officer (Meerut)
	Govt Veterinary Hospital, (Meerut)	Dr Virendra Singh
	NGOs	Mr Martand Singh, Sr Manager
	Brookes Hospital for Animals, Meerut	Ms Sirjana Nijjar, Head of Advocacy
	Field Unit – A self help group (Society)	Mr Faizan Jaleel, Head of Region
	Animal Care Society, Meerut	Dr Anshu Mali
	Private Veterinary Pathology Lab (Vet Lab)	Dr Ranjan Ahlawat
Odisha: Team B - John Weaver, John Woodford & Caitlin Holley		
22/2/18	District Veterinary Office, Cuttack	Dr. H.B. Nayak, Chief District Veterinary Officer
		Dr. S.Samantaray, ADVO
		Dr. R.C. Sahoo, ADVO
		Dr. Asish Pattnaik, Nodal Officer
	Clinical Investigation Laboratory, Cuttack	Dr. S. Mahapatra, RIO
	Duck Breeding Farm	Dr. Laxmi Rani Munda, Manager,
		Dr, Digambar Nayak, Deputy Director
	Livestock Aid Centre, Bentakar & Mobile Veterinary Unit	Dr. Deepak Senapati, VAS
		Dr. B. B. Routray, VO, Mobile Veterinary Unit
		Shri, Shrikant Tripathy, LI
	Veterinary Poly Clinic, Buxibazar	Dr. Roshni Budh, BVO
		Dr. Prafulla Kumar Das, Deputy Director
	Pashupati Feed Plant	Mr. Prakash Rout, MD,
		Dr. Digambar Nayak, Deputy Director
		Dr. Gopal Tripathy, Deputy Director

23/2/18	Poly Clinic, Sahid Nagar & Animal Birth Control Unit	Dr. Mahesh Mishra, ABC Consultant
		Dr. Anil Das, SDVO
		Dr. Sashi Bhusan Swain, BVO
		Dr. Jaimini Mohapatra, BVO
	OPOLOFED Chicken Fresh Counter	Dr. Pratap Patnaik, GM, OPOLOFED
	Veterinary Medicine Sale Point	Golak Nath Rout, Proprietor of Shop
	Animal Disease Research Institute, Phulnakhara	Dr. Loknath Behera, Joint Director
		Dr. P.K. Tripathy, RO
		Dr. Sambit Mishra, RO
		Dr. S.M.Khatua, RO
		Dr. M.K. Nayak, RO
John Woodford & Caitlin Holley		
23/2/18	College of Veterinary Science & AH, Bhubaneswar TVCC and wildlife Centre	Dr. Niranjan Sahoo, Prof, Wildlife
		Dr. M.R. Das, Director, TVCC.
John Weaver		
23/2/18	SDDL laboratory	
	Veterinary Officers Training Institute, Bhubaneswar	Shri. Mahendra Mallick, IAS,Commissioner-cum-Director, AH
		Dr. Basudev Sunani, Principal, VOTI
	International Centre for FMD, Bhubaneswar	Dr. Brahmadev Pattnaik, Director
		Dr. B.B. Dash, Consultant
		Dr. Rajeev Ranjan, Scientist
		Dr. J. Biswal, Scientist
		Dr. H.K. Sahoo, Deputy Director
24/2/18	Chilika Wildlife Division	Dr. Nalini Kanta Mohanty, CDVO
	Nalabana wildlife sanctuary	Dr. D. Solanki, BVO
		Dr. Samapika
		Shri. P.K. Mohanty, Asst. Conservator of Forest
	Local Dairy Farm in village Balugaon	Dr. D. Solanki, BVO
		Krushna Routray, Farmer
	Lagre Scale Layer Farm, Tangi	Shri. Manas Ranjan Mangaraj, Owner of Farm
		Dr. Digambar Nayak, Deputy Director
		Dr. Tushar Sahoo, BVO
Telengana: Team B - John Weaver, John Woodford and Caitlin Holley		
25/2/18		Dr . D. Venkateswarlu, Director
	Directorate of Veterinary and Animal Husbandry Services, Government of Telangana	Ramchander, Additional Director
		Dr . Sudhakar, Assistant Director
		Dr Chandrashekar, Assistant Director
	Telangana State Veterinary Biological & Research Institute	Dr . A.V.Krishna Mohan, Joint Director
		Dr . M.A.Mujeeb Ather, Deputy Director
		Dr . Malleshwari, Deputy Director
		Brahmananda Rao P., State Head of Operations, GVK EMRI
		Dr. Rohit Kumar C., Project Head
		Dr. Ramana Rao GV, Director EMLC, GVK EMRI
	Veterinary Hospital, Patencheru	Dr. Rama Rao Rathod, DVAHO, Sangareddy
		Dr. P.Shekar, Assistant Director
	M/s. Frigerio Conserva Allana Pvt Ltd. Zaheerabad, Telangana State.	Dr Chetan Kumar Thota, Director
		Mr Jawed Mohd. Khan, General Manager
		Mr M. Venkata Ramana Reddy, Head- Corporate Quality
		Dr C Ramakrishnan, Chief Veterinary Officer
	National Dairy Development Board R&D laboratory	Dr. SK Rana, Group Head (Animal Health), NDDB, Anand
		Dr. NM Ponnanna, Scientist – II, NDDB R&D Laboratory,
		Dr. LN Sarangi, Scientist – I, NDDB R&D Laboratory,
	INDIAN IMMUNOLOGICALS LIMITED; GACHIBOWLI, HYDREABAD-32	Dr Prasanna Deshpande – Dy Managing Director
		N S N Bhargav, Vice-President)
		Dr Srinivas Karnati, Dy General Manager (QC)
		Adhir Choubal, Vice-President (QMS)
		B Venugopal Rao, Vice-President (AH Manufacturing)

27/2/18	SSVH,Narayanaguda,Hyderabad	1.Dr.M.Praveen Kumar, Superintendent
		2. B.S.Jeevana Jyothi, AD(AH)
		3. Dr.B.Bhagavan Reddy ,DV&AHO,
		4. Dr, B.Swathi, VAS
	ICAR – NRC on Meat, Hyderabad	Dr. S. Vaithiyanathan, Actg. Director
		Dr. S. B. Barbuddhe, Principal Scientist
		Dr. S. Girish Patil, Principal Scientist
		Dr. B. M. Naveena, Senior Scientist
Andhra Pradesh: Team B - John Weaver, John Woodford and Caitlin Holley		
28/2/08	Directorate of Animal Husbandry, Vijayawada	Dr. G.Somasekharam, Director
		Dr. T.Damodar Naidu, Addl. Dir
		Dr. K.Gabriel, Joint Director
		Dr. Majari, IPM Director
	Super Speciality Veterinary Hospital, Vijayawada	Dr. K.Surya Kumar, Joint Director
		Dr.Prasad, Asst. Director
		Dr. Sai Gopal, VAS
		Dr. T.Damodar Naidu, Addl. Dir
	Epidemiology Section, DIRECTORATE OF Animal husbandry	Dr. P.B.R.Reddy, Deputy Dir
		Dr. BVL. Narayana, Asst. Dir
	VBRI, DI Wing	Dr. L.Ratna Kumari, Joint Director
		Dr. Mohanamba, Asst. Dir
		Dr. Krishna Jyothi, Asst. Dir
	ADDL, Vijayawada	Dr. Nagesh Babu, Asst. Dir
		Dr. Narasimha Reddy, VAS
	Vijaya Dairy, Vijayawada	Babu Rao, MD
		Dr. Prasad, Manager Inputs
		Jagan Mohan Rao, Technical Officer
	Model Dairy, Vijayawada	Dhanprakash, MD
		Dr. Nageswara Rao, Manager
	Kisan Mela at CVSC, Gannavaram	Dr. G.S.Rao, Asso. Dean
		Dr. Subramanyeswari, Prof Extension
	Cooperative Milk collection Centre at KV Kandrika and Dairy Farm	Dr. Prasad, Vijaya Dairy Manager
		Dr. Radha Krishna, Asst. Dir
		Jagan Mohan Rao, Director
1/3/18	Small Dairy Holding, K.Bitragunta	Dr. Ravindra Nadh Tagore, Jopint Dir
		Dr. Sk.Khalisha, Deputy Dir
	Vety Dispensary, Jaladanki	Dr. Koteswara Rao, Deputy Dir
		Dr. K. Venkata Rao, Asst. Dir
		Dr. Praveen, VAS
	NKBC (National Kamadhenu Breeding Centre), Chintaladevi	Dr. Kondala Rao, CEO, APLDA
		Dr. Brahmaiah, Joint Director, NKBC
	Animal Check Post, Tada, Nellore District	Dr. Surendra, VAS
		Srinivas, VA
Tamil Nadu: Team B - John Weaver, John Woodford and Caitlin Holley		
3/3/18	Small Animal Clinics, Madras Veterinary College, TANUVAS	Dr. K. Kumanan, Dean, Faculty of Veterinary Sciences
		Dr. Cecilia Joseph,
	Large Animal Clinics, Madras Veterinary College, TANUVAS	HOD Veterinary Clinics
		Dr. Gunaseelan , Dean, Faculty of Basic Sciences
		Dr. Jaya T.Raj,HOD Veterinary Clinical Medicine
	Department of Biotechnology,	Dr. K. Vijayrani , Prof and Head
	Madras Veterinary College, Vepery, TANUVAS	Dr. K.G. Tirumurugan, Prof
		Dr. M. Parthiban, Prof
		Dr. S. rathnaprabha, Assistant Prof
	Department of Parasitology,TANUVAS	Dr. Bhaskaran Ravi Lata , Prof and Head
		Dr. S. Gaurishankar
	Department of Veterinary Microbiology,TANUVAS	Dr. J. John Kirubaharan , Prof and Head
		Dr. M. Vidhya
	Meeting with State Animal Husbandry Officials/ Swarajya Hall, Heritage Building, Madras Veterinary College, TANUVAS	Dr. Mohammed Uthuman, Joint Director (9443176429)
		Dr. Balakrishan, Additional Director (9445001103)
		Dr. Radhakrishnan, AD
	Interaction with pre-final year UG students	About 20 students
	Central Zoonoisis Laboratory,	Dr. K. Kumanan, Dean, Faculty of Veterinary Sciences and
	Madhawaram campus, TANUVAS	Dr. Gunaseelan , Dean, Faculty of Basic Sciences
		Dr. Ravi , Prof
	Central University Laboratory,	Dr. K. Kumanan, Dean, Faculty of Veterinary Sciences and
	Madhawaram campus, TANUVAS	Dr. Sobha Rani, HOD
		Dr. Anandkumar
		Dr. Manimackam
	Translational Research Platform for Veterinary Biologicals (TRPVB), Central	Dr. K. Kumanan, Dean, Faculty of Veterinary Sciences and
		Dr. Prof. G. Dhinakar Raj , Project Director

4/3/18	Animal Quarantine and Certification Services (AQCS), Chennai	Dr. Tapan Kumar Sahu, Quarantine Officer
		Mr. Anubhav Mittal , Quarantine Inspector
		Ms. Usha Madhwan, UDC
		Mr. Manoharan
	Guindy National Park, Guindy, Chennai	Mr. K. Mohan, Ranger Officer
		Mr. Clement Edison
		Mr. G. Murugappa, Forest Guard
		Mr. G. Elumalai , Forest Guard
5/3/18	Veterinary Hospital, Poonamallee, Chennai	Dr. Kamiappan, Joint Director
		Dr. Renuka , Veterinary Officer
		Mr. A. Nurullah, Senior Veterinary Livestock Supervisor
	FMD vaccination at Nazrathpet, Tiruvallur Municipality	Dr. Sravana , Assistant Director
		Dr. Kanaga Suhila, Assistant Director
		Dr. Satipriya, Assistant Director
		Mr. G. Trinava , Chairman, Tiruvallur Municipality
		Mr. Ravindernath, Vice Chairman,
		Mr. Gautaman , Member, Tiruvallur Municipality
		Dr. Srinivalem
John Weaver		
5/3/18	Visit to Institute of Veterinary Preventive Medicine, Ranipet, District Vellore, Tamil Nadu.	Dr. Chandrika, In-charge
		Dr. John Koruth, RO, incharge new Bacterial vaccines facility
		Dr. Sandil Narain, ARO, Sheep Pox Vaccine Section
		Dr. Magaiyarkarasi, ARO, Anthrax Spore Vaccine Section
		Dr. Joel, ARO, Anthrax Spore Vaccine Section
		Dr. D. Raja Sekaran, RO, Test and Quality Control Section,
		Dr. Ravikumar, ARO, Test and Quality Control Section
		Dr. Belagaresan, ARO, Sterilization, Labelling and
		Dr. Vijaya, ARO, Sterilization, Labelling and Packaging
		Dr. Sangeetha, ARO, Brucella Antigen and other diagnostic
		Dr. Jaffrin, HS Bacterial vaccine section
	Visit to Regional Centre of All India Coordinated Research Project on FMD, Institute of Veterinary Preventive Medicine, Ranipet, District Vellore, Tamil Nadu.	Dr. Smriti, In-charge
		Dr. Rajashekaran
John Woodford		
5/3/18	Visit to Slaughter house at Villivakkam, Chennai	Dr. Kamal Hussai , Veterinary Officer
		Dr. Dyson Raj, Veterinary Assistant Surgeon
	Visit to Tamil Nadu Vetrerinary Council,	Dr. Manivannan, Registrar
	Visit to Director, AH & VS, Tamil Nadu	Mr. Kamaraj, Director
Chhattisgarh: Team B - John Weaver & John Woodford		
6/3/18	Secretariat, Naya Raipur, Chhattisgarh	Shri Anoop kumar Shrivastav, Secretary Agriculture & AH
		Dr S K Pandey, Director, Livestock Development Department
		Dr Neetu Gordiya
		OSD, Livestock Development Department
		Dr. Amit Jain, VAS

7/3/18	Central Semen Station	Dr Sanjeev Sahasbuddhe
	Anjora (Durg)	Office –In-charge
		Dr A K Nair
		VAS
	College of Vet Sci & AH	Dr S P Tiwari, Dean
		Dr Sanjay Shakya, Prof & Head
		Dr S K Maitee, Prof Head Medicine
	Indian Broiler Group	Dr Ravindra Jaiswal, President
	Farmers Interaction - Singhola &	Dr R K Sonwane, Deputy Director Veterinary Services,
	Bhawarmara	Dr Pratibha Bhosle VAS
		Dr Moolchand Desmukh VAS
	District Veterinary Hospital, Chhattisgarh	Dr I P Singh, Office –In-charge
		Dr Sanjay jain, VAS
		Dr Kiran Chowdhary, VAS
		Dr Suraj Diwan, VAS
	Govt Cattle Breeding Farm, Chhattisgarh	Dr Anjana Naidu
		Joint Director Veterinary Services, Raipur
		Dr Ajay Pandey. Officer-In-Charge
		CBF, Chandkhuri
		DR. V. K. Awasthi, VAS
		Dr Ajay Agarwal, VAS
	District Disease Investigation Laboratory,	Dr N K Shukla, Deputy Director
	Raipur	Dr Varsha Sharma,VAS
		Dr Arpana Patel,VAS
	State Veterinary Referral Hospital, Raipur	Dr. Abhishek Khare, VAS,
		Dr. Aniruddha Sengar, VAS,
	State Level Disease Investigation Lab,	Dr. Sandhya Sharma, VAS, Joint Director Office, Raipur
	Raipur	Dr. Ranu Sharda, VAS,
		Dr. Archana Tandon, VAS,
Gujarat: Team A - Howard Batho & Susanne Munstermann		
23/2/18	GVK-EMRI , Emergency Management &	Mr. Jashvant Prajapati, Chief Operating Officer
	Research Institute) Naroda, Ahmedabad	Mr. Narendrasinh Rathod,Public Private Partner
		Mr. Rohit Shrivastav, Project officer
	SGVP Gaushala,	Dr. K.V. Patel, Joint director & Member Secretary, Gauseva &
	(Shri Swaminarayan Gurukul Vishva	Dr. H. Teggi, Deputy Registrar, CHRS-Ahmedabad
		Shastri Swami, SGVP Gaushala
	Directorate of Animal Husbandry, Gujarat	Dr. A. J. Kachhiapatel Director of A.H, Office of Director
	State, Gandhinagar	Dr. D. M. Patel, Deputy Director (Animal Health), Directorate
		Dr. M. K. Chauhan, Deputy Director (Epidemiology),
	Field visit at Patan District	Dr. N. S. Patel, Deputy Director (AH), District Panchayat,
		Dr. R. S. Patel, Veterinary Officer, Balisana, District- Patan
		Dr. Prajapati, I/C Assistant Director, Animal Disease
	Frozen Semen Station, Patan	Dr. Hita Patel- Chief Executive Officer, Gujarat Livestock
		Dr. A. B. Modi- Assistant Director, State Frozen Semen
24/2/18	Veterinary Polyclinic, Vadodara	Dr.Damor Deputy Director,
		I/C Veterinary Polyclinic, Vadodara –
		Dr. Tejas Shukla – Veterinary Officer, Veterinary Polyclinic,
	Animal Disease Investigation Office,	Dr. M.C.Patel, Assi. Director, Animal Disease Investigation
	Vadodara	Dr. V.B.Patel, Veterinary Officer, Vadodara
	Regional Joint Director Office, Vadodara	Dr. N.K.Rohit, Regional Joint Director of Animal Husbandry,
		Dr. R.V.Vachani, Veterinary Officer, Regional Joint Director
	National Dairy Development Board, Anand	Dr. S.K.Rana , Group Head, Animal Health, National Dairy
		Dr.G.K.Sharma ,Advisor National Dairy Development Board ,
	Kaira District Co –Operative Milk Producers'	Mr. Shri Ravisankar , Chief Operating Officer , AMUL
	Union Limited (AMUL) Anand	Dr. Bency – Senior Manager, Reserch Development,
	Veterinary Dispensary, Petlad, Anand	Dr. Snehal Patel, Deputy Director of District Panchayat,
		Dr. D.G.Patel, Veterinary Officer, Petlad, Anand

Maharashtra: Team A - Howard Batho & Susanne Munstermann		
25/2/18	Central Growers & Broodres Farm, Venkateshwara Hatcheries, Poultry	Dr. M.M. Chawak
		Dr. Jadhav
26/2/18	State Training Institute, Pune	Dr. Mahajan
		Dr. Bhagwat
	Insititute of Veterinary Biological Products, Pune	Dr. Rathumare
		Dr. Firke
	Commissionate of Animal Husbandry, Pune	Mr. Umap, Commissioner
27/2/18	Royal Western Turf Club of India, Pune	Dr. M.Rajasekhar, Technical Director, Diagnostic Research
		Dr. Ound
	BAIF(NGO), Uruli Kanchan	Dr. A.B.Pande, Sr. Vice President
		Dr. Jayant Khadse
	Brooks Hospital for Animals, Ahmednagar	Maj Gen M.L. Sharma, CEO, Brooks
		DR. Faizan
28/2/18	M/S Frigorifico Allana Slaughter House, Aurangabad	Dr. Shirish Shirsat
		Dr. Moinuddin
	Veterinary Poly Clinic, Aurangabad	Dr. G.N. Pande
	Regional Diseases Investigation Laboratory, Aurangabad	Dr. Chandel
		Dr. Deshmukh
	Veterinary Dispensary, Chouka Dist	Dr. Deshmukh
Kerala: Team A - Howard Batho & Susanne Munstermann		
2/3/18	State Laboratory for Livestock, Marine & Agri Products, Maradu, Kochi	Dr.Mini A, Deputy Director
		Dr.Robin J Paul, Veterinary Surgeon
		Dr.Manju Soman, Veterinary Surgeon
	District Veterinary Centre, Ernakulam	Dr.P.K.Sadanandan, District Animal Husbandry Officer
		Dr.Mary James, Chief Veterinary Officer
	Veterinary Sub Centre,Ernakulam	Dr.Razeena K, District Epidemiologist, Animal Disease
		Dr.Ranju Antony, Veterinary Surgeon, Veterinary Dispensary,
		Mr.Arun (Owner), Haritha Farms, Okkal, Ernakulam
		Dr.Manju Meenakshi, Veterinary Surgeon,
		Mr. K N Suresh Babu, Livestock Inspector
3/3/18	KLD Board Bull Station, Mattupatty, Iduki District	Dr.Sudheer S, Deputy General Manager,
		Dr.P S Arun Kumar, Manager
		Dr. Sumeet, Assistant Manager
		Dr. Deepthi S Rose
	Meat Products of India, Edayar, Koothattukulam	Dr. Bijulal, Managing Director
		Dr. Saji Eassow, Manager (Production)
4/3/18	State Institute for Animal Diseases, Palode, Thiruvananthapuram	Dr.Prasad M K, Chief Disease Investigation Officer
		Dr.Swapna Susan Abraham, Disease Investigation Officer
		Dr.Nandakumar S, Veterinary Surgeon
	Institute of Animal Health and Veterinary Biologicals, Palode, Thiruvananthapuram	Dr.Jayachandra Kammath, Standardisation Officer & Director
		Dr.Surya S, Assistant Research Offcer
		Dr.Roy Mathew, Research Assistant
	Thiruvananthapuram	Dr.N N Sasi, Director of Animal Husbandry
		Dr.K K Jayaraj, Additional Director(AH)
		Dr. B Bahuleyan, Additional Director(Plg)
Karnataka: Team A - Howard Batho & Susanne		
5/3/18	NIVEDI	Director NIVEDI, and all officials were present during
	Indian veterinary research institutes - IVRI	Joint Director and all officials were present during discussion
	Karnataka Veterinary Council	Joint Director and all officials were present
	Epidemiology-NIVEDI	Joint Director, Deputy director (livestock disease control)and
6/3/18	Veterinary dispensary, Hessarghatta	Chief Veterinary officer, Dr.Siddappa
	Meeting with local farmers, Hessarghatta	
	Central poultry disease organization Hessaragatta.(CPDO)	Director
	Karnataka milk federation	Director
	Central semen frozen production and training institutes, Hessaragatta	Director
	Central cattle breeding farm, Hessaragatta	CHIEF VETERINARY OFFICER (CCBF)
	Veterinary college, Hebbal Bengaluru	Dean and staff members of teaching faculty
	Veterinary college Hospital,bengaluru	Staff members of teaching faculty were present
	Institutes of animal health and veterinary biologicals,	Director and team of scientists
	State drug control	Assistant drug controller
7/3/18	National diary and research institute, Audugodi,Bengaluru.	Director
	National institute of animal nutritional physiology, Audugodi	Director
	Srinidhi vet pharma	Retailer of the shop
	Airport quarantine, Bengaluru	Quarantine officer

DADF - whole team		
9/3/18	Mission 1 - closing meeting	Shri. Tarun Shridhar, Secretary, ADF
		Suresh S Honnappagol, Animal Husbandry Commissioner
		Dr. O.P. Chaudhary, Joint Secretary
		Dr. G.N. Singh, Joint Secretary
		Shri. P.K. De, Advisor(Statistics)
	Mission 1 - Competent authorities/stakeholder meeting	Dr. Suresh S Honnappagol, Animal Husbandry Commissioner
		Dr. Ashok Kumar, Asst. Director General (AH), ICAR
		Col. Dr. Amit Kumar, Director (Tech.) Remount Veterinary Services
		Dr. A.K. Mishra, Joint Director, FSSAI
		Dr. Amit Sharma, Joint Director, Exports Inspection Council of India
		Dr. Naveen Gupta, Joint Director, National Centre for Disease Control
		Dr. Khasnobis, Joint Director, NCDC
		Dr. U.K. Vats, Joint Director, APEDA
		Secretary, Animal Welfare Board of India
		Dr. Saurabh, Brooks Hospital for Animals
Mission 2		
Date	**Name of the Institute**	**Key persons met**
Rajasthan: Team A - Howard Batho & Susanne Munstermann		
15/4/18	Marwari Horse Breeding Society, Jodhpur	Col. Dr. Umaid Singh, Secretary General
		Dr. Mahendra Singh Rathore, Registrar
		Shri. Dhwajraj Singh Rathore, Extenstion Officer
	Veterinary Poly Clinic Jodhpur	Dr. Dasrath Singh Rathore, Joint Director, Jodhpur
		Dr. Laxman Singh Chundawat, Deputy Director
		Dr. Bhanu Prakash Chadda, Senior Vety. Officer
	Regional Disease Diagnostic Centre,	Dr. Gangadhar Sharma, Deputy Director
		Dr. Vipin Gupta, Senior Veterinary Officer
	Paravet and Farmers Training Centre	Dr. Abrar Ahmed Quazi, Joint Director
		Dr. Sanjay Singhvi, Deputy Director
		Dr. Shweta Kuchchawa, SVO
	Pannalal Gausala, Jodhpur	Shri Salegram Ji Tak, Chairman
		Dr. Narendra Martia, Veterinary Officer, Mandore
		Dr. Laxman Das, Veterinarian, Gousala
16/4/18	ICAR-Central Sheep and Wool Research Institute, Avikanagar and Interaction with Shepherds	Dr. A.K. Tomar, Director
		Dr. G.G. Sonowane, Principal Scientist
		Dr. A.K. Shinde, Principal Scientist
		Dr. Ragvendra Singh, Principal Scientist
		Dr. D.K. Sharma, Scientist
		Local Sheep rearing farmers
17/4/18	Meeting at Directorate of Animal Husbandry, Rajasthan, Jaipur	Dr, Ajay Gupta, Director, AH with all Additional Directors, Joint Directors, Deputy Directors and other officers of
	State Disease Diagnostic Laboratory, Jaipur	Dr. J.P Yadav, Joint Director
		Dr. Sandeep Agarwal, SVO
		Dr. Shweta Shrimali, SVO
		Dr. Lenin Bhatt, Veterinary Officer
	Post Graduate Institute of Veterinary	Dr. Vishnu Sharma, Dean and other faculty
	Paravet Diploma Training School, Bassi	Dr. B.S. Yadav, Deputy Director
		Dr. B.M. Goyal, SVO
		Dr. Alok Goud, SVO
	Visit to village Mohanpura	Dr. S.K. Jindal, Veterinary Officer, VH, Debgaon
		Local farmer-Shri Mahesh Sharma
Haryana: Team A - Howard Batho & Susanne Munstermann		
18/4/18	State Disease Diagnostic Laboratory, Sonipat	Dr. Jaswant Dahiya, Deputy Director
		Dr. Vipin Khasa, Veterinary Surgeon
		Dr. Pankaj Tomar, Veterinary Surgeon
	ICAR-National Dairy Reserch Institute, Karnal	Dr. R.R.B Singh, Director, ICAR-NDRI
		Dr. G.R.Patil, Joint Director
		Dr. Bimlesh Mann, Joint Director
	Animal Breeding Research Centre, NDRI, Karnal and Cattle Yard	Dr. T.K. Mohanty, Principal Scientist

Punjab: Team A - Susanne Munstermann		
19/4/18	Meeting at Pet Medical Centre, Panchkula, Haryana with States of Punjab, Haryana and Chandigarh	Dr. G.S Jhakar, Director General, AH, Haryana
		Dr. Amarjeet Singh, Director AH, Punjab
		Captain Karnail Singh, Director AH , Chandigarh
		Other officers of Directorate and other line Departments.
	M.K Overseas Pvt Ltd Export Slaughter house, Derabassi	Dr. Parmatma Saroop, Deputy Director, AH
		Dr. Muneesh Kumar, Veterinary Officer
		Shahnawaz Ahmed, Factory Manager
		Dr. Ashish Deogade, QA Manager
		Dr. K.P.S Pasricha, Veterinary Officer
	Centre of Excellence of Cattle Development, Rauni, Patiala	Dr. Gurdeep Singh, Joint Director
		Dr. H.M Walia, Deputy Director
		Dr. Amit Khurana
		Dr. Harpreet Singh
		Dr. Kanwer Anoop Kaler
		Dr. Gagan Kaushal
20/4/18	Veterinary Polyclinic, Ludhiana	Dr. G.S Toor, Deputy Director
		Dr. Reena Walia, Pathologist
		Dr. Kiranbir Singh, VO
		Dr. Sunil Bharadwaj, Surgery Specialist
		Dr. Chetan Kumar Gupta, Gynaecologist
	GADVASU, Ludhiana & Veterinary College	Dr. Prakash Singh Brar, Dean
		Dr. J.P.S Gill, Director(Research)
		Other Scientists and Professors of GADVASU
	Kamdhenu Gausala, Noormahal	Kuldeep Singh
		Dr. Satvir Singh Bajwa, SVO, Philore
		Dr. Gourav Sharma, VO, RDDL, Jalandhar
21/2/18	Veterinary Hospital, Hathigate, Amritsar	Dr. Desh Deepak, Deputy Director
		Dr. Rajesh Dogra, Deputy Director
		Dr. Kanwarjit Singh Hundal, SVO
	Visit to Border Check Post, Wagah	Dr. Inder Singh, Commandant (Veterinary), BSF
Himachal Pradesh: Team A - Howard Batho		
19/4/18	Small Village farmer in Village Datiyar, District Solan	Mr. Hari Krishna, Farmer
		Dr.Munish Batta, Deputy Director
		Dr. Anupam Mital Deputy Director
	Directorate of AH, Himacahal Pradesh, Shimla	Dr. S.K.Chaudhary, Director AH
		Dr. Mandeep Sharma Dean College of Veterinary Sciences
		Dr. Munish Batta, Deputy Director
		Dr. Vijaya, designated officer, FSSAI
		Dr. Sandeep Rattan, Assistant Director, Wildlife
		Dr. Om Hari Chaturvedi, Head, ICAR-NTRS
20/4/18	Modern abattoir, Shimla	Dr. Neeraj Mohan, Veterinary Public Health Officer, Municipal
		Dr. Namita, Veterinary Officer, Modern Abbatoir
	Epidemiology Lab, Disease Invetigation Lab and State Veterinary Hospital Complex , Shimla	Dr. Vikram Vashist, Sr. Veterinary Officer, Epidemiol.
		Dr. Pooja Kanwar, Veterinary Officer, DI Lab
		Dr. Pooja Kanwar, Veterinary Officer, DI Lab
21/4/18	Kamdhenu Hitkari Manch; Farmers' Milk Co-op. Namhol	Sh Jeet Ram Kaundal, Seceratary of the co-op
		Sh. Nanak Chand, President of the co-operative society
	Himalayan Nature Park, Kufri	Dr. Rohit Sharma, Wild life Veterinarian, Dept. of Forests
Uttar Pradesh: Team A - Howard Batho & Susanne Munstermann		
23/4/18	Zoological Park, Lucknow	Dr. K.P. Singh
		Dr. Vinod Kumar, Deputy Director
24/4/18	Polyclinic, Lucknow	Dr. V.K. Srivastav
	Uttar Pradesh Livestock Development Board	Dr. A.N. Singh, CEO, UPLDB
	Control Room NIC for VC	Dr.J.P. Verma
	SPCA-Dog Shelter Home	Dr. P.K. Tripathy, Manager
	Goushala	
	Biological Production Unit	Dr. Tejbir Singh, CVO, Lucknow
		Dr. RRP Singh, AD with other officers
	Meeting with Secretary, Animal Husbandry	Dr. Sudhir M Bobade, Secretary, AH
25/4/18	Veterinary Hospital, Mohanlalgang	Dr. Raj Dy CVO
	Animal Market	Dr. Rai, Dy CVO
	Poultry Farm Visit	

Uttarakhand: Team A - Howard Batho & Susanne Munstermann		
26/4/18	Uttarakhand Livestock Development Board,	Dr. M.S. Mayal, CEO
	Rishikesh	Dr. Ashish Deb, Asst. Director, AHD
	Dairy Development Department	Mr. Jaideep Arora
	Minucipal Cooperation	Dr. Vivekananda Sati, VO
		Dr. Ashutosh Joshi, OIC, Animal Welfare Board
	Forest Department	Mr. Jai Raj, PCCF
27/4/18	Wildlife Institute of India	Dr. V.B. Mathur, Director
		Dr. Pradeep K. Malik, Sr. Professor at Head
		Dr. Parag Nigam, Scientist F
		Dr. S.K. Gupta, Scientist
	Meeting with Secretary, Animal Husbandry	Dr. Meenakshi Sundaram, Secretary, AH
		Dr. K.K. Joshi, Director, AH
		Dr. P.S. Yadav, Joint Director
Uttarakhand: Team B1 - John Stratton and John Woodford		
12/4/18	IVRI, Muteshwar	No names provided
Uttar Pradesh: Team B2 - John Weaver		
12/4/18	IVRI, Bareilly and Baghpat	No names provided
Tripura: Team B1 - John Woodford		
19/4/18	Meeting with ARDD and Other Departmental officers	Dr. Kamal Krishna Majumder JD (HQ)
		Dr.Pran Kumar Das ,DD (DI), NO, PVS
		Dr. Subrata Sukla Das, Registrar TVC
		Dr. Sanjib Das, DD planning
		Dr.Shyamal Dasgupta, AD, SDIL
		Dr. Purnendu Narayan De, GCMPUL
		Dr. Kamal Chackraborty, AD(AH)
		Dr. Satyasundar Debbarman AD(DVMS)
		Dr. Jyotirmoy Roy , VO SDIL
		Dr.Jagannath Banik, VO (Statiscal cell)
		Dr. Vinoy Singh , Scientist , ICAR
	Paravet Training Institution (VTI)R.K Nagar	Dr. Anjan Saha Principal (VTI)
	Tripura (West).	Dr. Aravinda Dattagupta AD (VTI)
		Dr. Samiran Saha, AD (VTI)
	Collage of Veterinary Science and Animal	Dr. B.L Bijwal , Principal
	Husbandry, R.K Nagar, Tripura (West).	Dr. Bikash Debnath Asstt. Prof. Animal Nutrition
	International Border, Akhaura, Agartala ,Tripura	Sri Debasish Nandi, Manager LPAI
		Dr. Dipankar Biswas, Regional Officer, AQCS, Kolkata
	Inspector General .Border Security Force.Salbagan	Shri H.K Lohia, IPS , IG, BSF , Tripura
20/4/18	Veterinary Dispensary, Amtali, Tripura west	Dr. Sanjoy Dey Vety officer
	wild life Santuary and National park,	Dr. Kesheb Debnath, Vety. Officer, Zoo Vety hospital
	Sipahijala	Sri Naresh Jamatia, TFS, Director Zoo
	Meeting with District Forest	Mr. Jaykishan .V IFS , DIST. Forest officer
	Gomati Co-operative Milk producers Union	Ar. Harisankar Chackraborty – MD
	Limited, Indranagar, Agartala	Dr. Purnendu Narayan Dey - Vety officer
		Shri Santosh Dhar – Diary officer
		Shri Animesh Dey - Lab Incharge
	Meet with the Secretary, ARDD	Shri M.L Dey IAS Secretary
Mizoram: Team B1 - John Woodford		
21/4/18	Interaction with Director, Senior Officers of	Dr. Saingura Sailo, Director, A.H. & Vety Department
	A.H. & Vety Department,	Dr. R.C. Lalmuana, Additional Director,
		Dr. Hmarkunga, Joint Director,
22/4/18	Animal Feed Plant, Ramrikawn	Dr. V. Lalzarzova, Veterinary Officer,
	Rural Slaughter House, Mualpui, Aizawl	Dr. Lalfamkima, Veterinary Officer
		R. Lalthanzawna, Assistant Engineer,
	MULCO Dairy Plant, Thuampui, Aizawl	Dr. Lalremliana, Managing Director
		Dr. Lalrotluanga Sailo, Manager
23/4/18	State Veterinary Dispensary, Durtlang, Aizawl	Dr. Vanlalhruaia Pachuau, Veterinary Officer (VO
	Multicommodity Milk producer co-operative	Miss Hualthanpari, Secretary
	Society, Durtlang	Miss Vanlalruati, Assistant Secretary
	College of Veterinary Sciences & A.H.	Dr. L. Hnamte, Professor & in-charge Dean
	Central Agriculture University, Selesih,	Dr. Tapan Kumar Datta, Professor
	Aizawl	Dr. T.K. Rajkhowa, Professor

Jharkhand: Team B1 - John Woodford		
25/4/18	Ranchi Veterinary College Kanke	Interaction meet with different stakeholders
	Teaching Veterinary Clinical Complex	Dr. Arvind Sharma
		Dr. Praveen
		Dr. M.P Sinha
	Ranchi Abattoir complex	Mr. Sahid
	Institute of Animal Health and Production,	Dr. Vijay Singh
	Kanke	Dr. Sanjay
		Dr. Shreya Sinha
	Government Pig Farm at Kanke	Dr. Stenley Kujur
		Dr. Pappu
	Farmers Training Centre, Kanke	Dr. C B Singh
		Dr. Basant
	Visit to Paravet/PAIW training Centre	Dr. Dayanand Prasad
		Dr. K K Tiwari
	Milk Plant (operated by JMF)	Mr Narendra Sharma
		Dr. Samanta
26/4/18	Veterinary Surgeon office at Ranchi	Dr. Stenley Kujur
		Dr. Swetashrre
		Dr. Samir Sahay
		Dr. Amit
	Jharkhand Veterinary Council, Chutia	Dr. S S Munda Registrar
	Veterinary Dispensary Ormanjhi	Dr. Prafful Singh
		Dr. M K Jha
	Interaction with Progressive Poultry, Goatery	Dr. O P Pandey
	Interaction with Deputy Commissioner	Sri Ravi Shankar Shukla
	Interaction with Farm Managers, Training	Dr. M K Gupta
	School instructor and other Veterinary	Dr. Raj Kumar Singh
	Officers of District	Dr. Gautam Guha Kusum
		Dr. O P Pandey
	Visit to Veterinary Surgeon Office cum	Dr. Anand Sagar
	Clinical Complex working pattern of 24*7	Dr. Mazharul
Meghalaya: Team B2 - John Weaver & John Stratton		
19/4/18	Directorate A.H & Veterinary.	Dr. A. Bose. Director. A.H & Veterinary
		Dr. B.K. Mawthoh. Joint Director. A.H & Veterinary
		Dr. H. Kylla. A.H & Veterinary Officer (DI). State Nodal
	State Disease Diagnostic Laboratory.	Dr (Mrs). M. Kharchandy. Asst. Director. Disease
	Shillong	Dr. H. Kylla. A.H & Veterinary Officer (Disease Investigation).
	NADRS. State Node	Dr (Mrs). M. Kharchandy. Asst. Director. Disease
		Dr (Mrs). J. Niangty. A.H & Veterinary Officer (Disease
	State Vaccine Depot. A.H & Veterinary	Dr (Mrs). L. Dkhar. A.H & Veterinary Officer (Disease
	Lunch.	
	ICAR for NE Region. Umiam.	Dr. A. Sen. Principal Scientist. Animal Health Division.
		Dr. R. Laha. Principal Scientist. ICAR. Umiam
	Private Veterinary Pharmacy. NE Agency.	Shri. Joshua Lyngdoh. Shop Owner.
20/4/18	Private Butcher. Mawlai	Dr (Mrs). W. Challam. Senior A.H & Veterinary Officer.
	Dairy Co-Operative Society. Umlyngka	Mr. Peace Kharbteng. Adviser, Primary Dairy Co-Operative
		Mr. Chedrak Kharbteng. Secretary. Primary Dairy Co-
		Dr. H. Kylla. A.H & Veterinary Officer (Disease Investigation).
	Mylliem Block Dispensary. East Khasi Hills.	Mr. MacDonald Umdor. Veterinary Assistant. Mylliem
	Indo-Danish Project. Cattle farm. Upper	Dr. R. Sumer. Asst. Director. Indo-Danish Project. Cattle
		Dr. Reanold Warjri. A.H & Vety Officer. IDP.
	Sohra Veterinary Dispensary. East Khasi	Dr. H. Kylla. A.H & Veterinary Officer (Disease Investigation).
21/4/18	Multi-species Modern Slaughter House.	Dr (Mrs). W. Challam. Senior A.H & Veterinary Officer.
	Live Cattle Market. Byrnihat. Ri-Bhoi	Dr. R. Nongrum. A.H & Veterinary Officer. Byrnihat.

Assam: Team B2 - John Weaver & John Stratton		
21/4/18	NERDDL, Khanapara	Dr. A. K. Das, Director, AH & Vety, Assam
		Dr. R. N. Goswami, President, A. V. Council
		Dr. R. Buragohain, Director, Deptt of Dairy Development
		Dr. A. Buragohain, Prof & Head, Extension, CVSc
		Dr. K. Sarma, Professor, AICRP of FMD
		Dr. U. Phangshu, State Surveillance Officer, IDSP, Assam
		Dr. S. A Laskar, State veterinary Consultant, IDSP
		Dr. R. Bhatta, State Entomologist, IDSP
		Dr. M. I. Borbaruah, Director, Vet Hellp Line, India
		Dr. S. Dutta, Director, JBF
		Dr. P. Sarma, Nodal Officer, PVS,
	NRC on Pig, Rani	Dr. S. Rajkhowa, Director, NRC on Pigs
		Scientists and staff of NRC
22/4/18	Livestock Market (Chaygaon)	Panchayat Officials placed in the market
		Dr. H. Deka, BVO, Chaygaon
		Dr. R. Chakaravrty Asstt. Nodal Officer, PVS, Assam
	Koch para Veterinary Dispensary	Dr. Daisy VO
		Dr. S. Deka, VO, Chaygaon
		Paravets of the institution
		Dr. S. Sarania, Local Veterinary Officer
		Dr. R. Chakaravrty Asstt. Nodal Officer, PVS, Assam
	International border areas in Kumarikata (with Bhutan) and State Veterinary	Dr. S. C.Nath, DVO, Kamrup
		Dr. G. Boro, DVO, Baksa
	Municipal Regulations and activities	Veterinary Officer and paravets of Tamulpur Veterinary
		Dr. Manoj Goswami, Ex VO Guwahati Municipal Corp
	Slaughter house (ALPCO)	Dr. P. Konwar, Administrative Officer, ALPCO
	Office of JBF	Dr. S. Dutta, Director, JBF
23/4/18	College of Veterinary Sc., Khanapara	Dean, Faculty Of Vet Sc
	Advance Animal Disease Diagnosis and Management Consortium	Director of Research
		Prof and Head of all the departments
		Dr. S. K. Das, Professor
		Dr. N. N. Barman, Professor
	AICRP on FMD	Dr. K. Sharma, Professor
	NADRS state node	Dr. U. Nath, State Nodal Officer, NADRS
	Directorate of Health and Family Welfare	Dr. Bhuyan, Director, Health & FW
		Dr. Bhagawati, Joint Director, H & FW
		Sri L. R. Nampui, Food Safety Officer
		Dr. D. K. Das, Drug Controller
		Other officers from H & FW Deptt
	Assam State Secretariat- Interaction with Secretary	Smt. Devola Devi, IAS, Secretary, AH & Veterinary
		Smt. Dipali Devi, ACS, Jt. Secretary, AH & Veterinary
		Dr. A. K. Das, Director, AH & Veterinary
Madhya Pradesh: Team B2 - John Weaver & John Stratton		
25/4/18	Meeting at the Directorate conference hall and visit to call centre 1962	Shri Ajit Kesari IAS Principal secretary Govt. of M.P. Dpt. of
		Dr.RPS Baghel Dean College of Veterinary Science and AH,
		Dr.RK Mishra I/C Director BP Mhow
		Dr.Pramod Goel Deputy Director IDSP state unit MP
		Dr.Sakkale Veterinary consultant IDSP state unit MP
		Shri Jitendra Agrawal PCCF wild life
		Dr. HBS Bhadoria MD MPLPDC
		Dr.UC Sharma Registrar MP Vety council
		Dr. RK Mehiya JDVS,
		Dr. JS DawarJDVS,
		Dr,SKParnamJDVS,
		Dr.PS Patel JDVS
		Dr.AK Sharma DDVS,
		Dr.RK ShrivastavDDVS FMD,
	Visit to SAHTI Bhopal	DDVS SAHTI -Dr. SK Tiwari and his staff
	MPCDF Habibganj Bhopal	Dr Aruna Gupta IAS MD, MPCDF Bhopal
		Shri Jitendra singh Raje IAS CEO Bhopal Dugdh sangh
	Pachama Cattle Feed factory visit	Shri Rajesh Vijayvergiya Manager feed factory.
26/4/18	Visit to State Veterinary Hospital and	Dr. PS Patel JDVS SVH Bhopal and his team.
	State Animal Disease Investigation	Dr. SK Parnam JDVS SADIL Bhopal and his team.
	Nandini Gaushala visit	Shri Vishnu Patidar Manager Nandini Gaushala Bhopal
	Visit to Central Semen Station & Bull Mother Farm Bhopal	Dr. Deepali Deshpande Dr.HBS Bhadoriya Dr. KS Tomar
		Dr.Pallavi Chaubey
	Visit to Central Semen Station & Bull Mother Farm Bhopal	Dr.HBS Bhadoriya
		Dr. K.S. Tomar
		Dr. Amitabh Banarjee
	Visit to Van Vihar National Park (VVNP)	Mrs. Samita Rajora IFS Director, Van Vihar National Park
		Dr. Atul Gupta, Zoo Veterinarian

######	**Visit to NIHSAD Bhopal**	Dr. VP Singh Director, NIHSAD Bhopal and his team.
	Visit to Village Nana khedi Block Obedullaganj, District Raisen (Camp	Dr.Pramod Agrawal Deputy Director Veterinary Services Raisen & his team
	Interaction with Private Vety. Practitioner and Private Poultry vets & NGO Representatives	Dr. Sunil Bhindwale -Tech. Director Phoenix Group
		Dr. Mahendra Singh- Tech.Comm. poultry consultant
		Dr. Akash Waghmare -Vety Consultant Bhopal
		Dr. Kapil Chugh - Consultant C&M hatcheries Bhopal
		Dr. Parag Pandya - Veterinary practitioner.
		Dr.VP Chandrapuriya - Retd. Vety Surgeon
		Dr.SS Khare - Retd. veterinary practitioner
		Dr. SN Shrivastav- Retd. veterinary practitioner .
		Dr.Ashok S Jape BAIF representative.
		Dr.Anjani Kumar Tripathi JK trust Representative.
		Dr. Ranjan Neog Operational Manager
DADF - whole team		
2/5/18	Closing meeting	Shri. Tarun Shridhar, Secretary, ADF
		Shri Upamanya Basu, Joint Secretary
		Dr. Ashok Kumar, Asst. Director General (AH), ICAR
		Deputy Commissioners of DADF
		Assistant Commissioners of DADF
		Livestock Officers of DADF

Appendix 4: Air travel itinerary

Mission1

ASSESSOR	DATE	From	To	Flight No.	Departure	Arrival
John Weaver	16/02/18	Alice Springs	Sydney	QF791	12.10	16.30
	16/02/18	Sydney	Singapore	SQ242	19.10	00.20
	17/02/18	Singapore	Delhi	SQ402	02.35	05.55
	21/02/18	Delhi	Bhubaneshwar	AI473	18.45	21.00
	25/02/18	Bhubaneshwar	Hyderabad	AI776	10.55	12.25
	27/02/18	Hyderabad	Vijayawada	AI544	16.05	16.55
	06/03/18	Chennai	Mumbai	6E782	08.50	10.50
	06/03/18	Mumbai	Raipur	6E324	14.35	16.25
	08/03/18	Raipur	Delhi	AI469	07.30	10.05
	09/03/18	Delhi	Singapore	SQ403	22.10	06.15
	10/03/18	Singapore	Melbourne	SQ207	07.45	18.10
Howard Batho	17/02/18	London	Delhi	BA257	18:55	08:50
	23/02/18	Delhi	Ahmedabad	AI019	05.00	06.30
	25/02/18	Ahmedabad	Mumbai	AI614	07:25	08:55
	28/02/18	Aurangaban	Mumbai	AI441	20:20	21:30
	01/03/18	Mumbai	Kochi	AI681	17:15	19:15
	05/03/18	Thiruvananthapuram	Bengaluru	AI584	09:15	10:20
	08/03/18	Bengaluru	Delhi	AI505	10:00	12:45
	10/03/18	Delhi	London	BA256	11:05	15:10
Susanne Münstermann	23/02/18	Delhi	Ahmedabad	AI019	05.00	06.30
	25/02/18	Ahmedabad	Mumbai	AI614	07.25	08.55
	28/02/18	Aurangabad	Mumbai	AI441	20.20	21.30
	01/03/18	Mumbai	Kochi	AI681	17.15	19.15
	05/03/18	Trivandrum	Bengaluru	AI584	09.15	10.20
	08/03/18	Bengaluru	Delhi	AI505	10.00	12.45
John Woodford	18/02/18	Paris CDG	Dubai	EK074	1425	0015
	19/02/18	Dubai	Delhi	EK0510	0400	0840
	21/02/18	Delhi	Bhubaneshwar	AI473	1845	2100
	25/02/18	Bhubaneshwar	Hyderabad	AI776	1055	1225
	27/02/18	Hyderabad	Vijayawada	AI544	1605	1655
	06/03/18	Chennai	Mumbai	6E782	0805	1050
	06/03/18	Mumbai	Raipur	6E324	1435	1350
	08/03/18	Raipur	Delhi	AI469	0730	1005
	11/03/18	Delhi	Paro	KB205	0635	1030
Caitlin Holley	15/02/18	Tokyo	Bangkok	TG677	17:30	22:30
	17/02/18	Bangkok	Delhi	TG315	20:00	23:00
	21/02/18	Delhi	Bhubaneshwar	AI473	18:45	21:00
	25/0218	Bhubaneshwar	Hyderabad	AI776	10:55	12:25
	27/02/18	Hyderabad	Vijayawada	AI544	16:05	16:55
	04/03/18	Chennai	Bangkok	TG338	01:30	06:25
	04/03/18	Bangkok	Tokyo	TG676	08:00	15:50

Mission 2

ASSESSOR	DATE	From	To	Flight No.	Departure	Arrival
John Weaver	09/04/18	Incheon	Singapore	OZ751	16.10	21.30
	09/04/18	Singapore	Delhi	AI383	23.00	02.30
	15/04/18	Delhi	Pantnagar	AI9815	09.55	11.00
	18/04/18	Delhi	Guwahati	AI891	16.15	18.45
	23/04/18	Guwahati	Delhi	AI892	19.20	22.05
	25/04/18	Delhi	Bhopal	AI435	05.55	07.20
	28/04/18	Bhopal	Delhi	AI436	08.00	09.25
	02/05/18	Delhi	Singapore	SQ403	21.55	06.10
	03/05/18	Singapore	Phnom Penh	SQ5004	07.40	08.40
Howard Batho	10/04/18	London	Delhi	BA257	19.30	08.20
	14/04/18	Delhi	Jodhpur	AI 475	13.55	15.20
	17/04/18	Jaipur	Delhi	AI 9644	20.25	21.35
	22/04/18	Shimla	Delhi	AI9804	07.45	08.55
	23/04/18	Delhi	Lucknow	AI 431	12.20	13.30
	25/04/18	Lucknow	Delhi	AI 812	20.15	21.35
	26/04/18	Delhi	Dehradun	AI 9645	06.20	07.20
	28/04/18	Dehradun	Delhi	AI 9646	07.50	08.45
	04/05/18	Delhi	London	BA256	10:20	15:20
Susanne Münstermann	14/04/18	Delhi	Jodhpur	AI 475	13.55	15.20
	17/04/18	Jaipur	Delhi	AI 9644	20.25	21.35
	22/04/18	Amritsar	Delhi	AI 462	15.15	15.50
	23/04/18	Delhi	Lucknow	AI 431	12.20	13.30
	25/04/18	Lucknow	Delhi	AI 812	20.15	21.35
	26/04/18	Delhi	Dehradun	AI 9645	06.20	07.20
	28/04/18	Dehradun	Delhi	AI 9646	07.50	08.45
	05/06/18	Delhi	Jakarta	MH 191	23.00	10.15
John Woodford	09/04/18	Bergerac	Southampton	BE3644	1330	1410
	09/04/18	Southampton	Paris CDG	BE3035	1505	1720
	09/04/18	Paris CDG	Dubai	EK0076	2155	0630(+1)
	10/04/18	Dubai	Delhi	EK0516	0950	1445
	14/04/18	Delhi	Pantnagar	AI 9815	09.55	11.00
	18/04/18	Delhi	Kolkata	AI 20	14.25	16.40
	18/04/18	Kolkata	Agartala	AI 745	18.10	19.10
	20/04/18	Agartala	Kolkata	AI 746	19.45	20.45
	21/04/18	Kolkata	Aizawl	AI 711	13.15	14.15
	23/04/18	Aizawl	Kolkata	AI 712	14.50	15.55
	24/04/18	Kolkata	Ranchi	6E 344	11.35	12.40
	27/04/18	Ranchi	Delhi	AI 418	13.25	15.30
	02/04/18	Delhi	Dubai	EK0515	2150	2335
	03/04/18	Dubai	Paris	EK0071	0405	0925
	04/0518	CDG Paris	Southampton	BE3032	0925	0940
	04/0518	Southampton	Bergerac	BE3643	1025	1305
John Stratton	09/04/18	Paris	Delhi	AI0142	22.00	13.15
	14/04/18	Delhi	Pantnagar	AI9815	09.55	11.00
	18/04/18	Delhi	Guwahati	AI891	16.15	18.45
	23/04/18	Guwahati	Delhi	AI892	19.20	22.05
	25/04/18	Delhi	Bophal	AI435	05.55	07.20
	28/04/18	Bophal	Delhi	AI436	08.00	09.25
	03/05/18	Delhi	Paris	AI0143	13.15	18.55

Map 5: Showing states and main locations visited by the PVS Evaluation mission

Appendix 5: List of documents used in the PVS evaluation

The list attached here Is not comprehensive but gives an indication of the huge amount of material that was provide to the mission team. Key documents are referenced under each CC.

Code	Title	CC
SG1	FMD-CP Manual	II-7
SG4	Technical GI to implementation of LH and DCP programs	II-7
SG5	Action Plan for AI control 2015	II-6, II-7; III-6; II-5
JPW12	All India coordinated research project on Animal disease monitoring and	II-5A, II-5B, II-7
JPW19	DADF advisory note: use of antibiotics for treatment of food producing animals	II-11, IV-1
JPW41	Guide to Animal Welfare Laws, AWBI	II-13, IV-1
JPW70	NADRS network diagram	II-5A/B
JPW80	Forecasting of Animal Diseases by NIVEDI for the month of <>	I-5A, II-7
JPW81	District-wise Livestock Disease Forewarning for month of <>	II-5A, II-7, III-1
JPW86	Action Plan of Animal Husbandry for Preparedness, Control and Containmnet	II-6,
SG6	Supreme court ruling on slaughter of cattle: http://www.livelaw.in/supreme-court-	II-7, II-13, IV-1
SG7	details on where cow slaughter is permitted: https://www.news18.com/news/india/states-where-cow-slaughter-is-banned-so-	II-7, II-15, II-13
SG8	India country information	
SG9	India country presentation at HQ	
SG10	Brooke India	II-13
SG11	EIC_Export Inspection Council	IV-4
SG12	Central drugs control organisation	II-9
SG13	Integrated disease surveillance program MoH	II-5A/B
SG14	Animal Welfare Board	IV-4, II-13
SG15_	FSSAI food safety control	II-8A, II-13, IV-!, IV-3, IV-4
SG16	APEDA	IV-4, II-13, IV-5, II-8A, B&C
SG17	linkage to partners in DADF	III-3
SG18	linkage to APEDA	IV-4
SG19	linkage to Central Disease Diagnostic lab	II-1B
SG20	linkage to Agriculture coop and Farmers Welfare	III.2
SG21	linkage to Min of Environment, Forest and Climate change	II-13; III-3
SG22	linkage to MoH and FW	I.6B, II-3
SG23	linkage to ICAR	I.6B, II-4
SG24	linkage to Min of Information Technology	I.6B, II-5
SG25	linkage to other Ministrie	I.6B, II-6
SG26	linkage to RVS	I.6B, II-7
SG27	linkage to State AHD	I.6B, II-8
SG28	linkage to Statutory bodies	I.6B, II-9
SG29	linkage to Subordinate offices	I.6B, II-10
SG30	linkage to Universities and colleges	I.6B, II-11
SG31	Action Plan Glanders	II-7; II-5
SG32	http://www.nic.in/services/Video%20Conferencing	III-1
HLB6	Annual Report DAH 2016-2017	I-1A/B, I-7, I-11II-4, II-1, II-4, II-5, II-7, II-9, II-5I, V
JW1	The Prevention and Control of Infectious and Contagious Diseases in Animals	II-7, IV-1
JW13	Assessment of Core Competencies of Livestock Extension Professionals in	I-2A. I-3
JW14	Improving the delivery of Veterinary Services in India (Rev. Sci. Tech. Off. Int.	I-1A&B, I-2A&B, I-3
JW20	Advisory Notice – Subject: Use of antibiotics for treatment of food producing	II-8C
JW21	User Manual – Export abattoirs – Online registration Manual (http://itrack.apeda.gov.in/PUPOnline/UserManual/MeatPlantsUserManual.pdf)	II-8A, B&C
JW22	Food Safety and Standards Act (2006)	II-8A, B&C
JW23	Food Safety and Standards Rules (2011)	II-8A, B&C
JW29	Assessment of Core Competencies of Livestock Extension Professionals in	I-1A&B
JW31	Veterinary Council Act of India (1984)	III-5A&B
JW32	Veterinary Council of India – Standard of Professional Conduct, Etiquette and Code of Ethics, for Veterinary Practitioners) Regulations 1992	III-5A&B
JW33	Export (Quality Control and Inspection) Act (1963)	I-4, II-4, II-8C

JW40	Food safety and standards (Licensing and registration of Food businesses)	II-8A,B&C
JW43	Zoonotic Diseases of Public Health Importance – Manual	I-6B, II-7
SG35	National Guidelines on Leptospirosis (NCDC)	
SG36	Plague control in India (NCDC)	II-4
SG37	Annual Report Zoonotic Disease division NCDC 2016	II-5
SG38	Gokul Gram Project	II-6
SG39	Rabies statistics https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2244675/	II-7
SG40	Rabies statistics https://www.hindustantimes.com/health/rabies-deaths-down-by-a-third-in-three-years-in-india-but-snakebites-continue-to-kill/story-	II-7
JPW41	CCSNIAH brochure	II.9
JPW42	CCSNIAH ppt	II.9
JPW43	IVRI annual report 2016-2017	II.5A/B, II.9
JPW44	CADRAD training modules	II.1
SG41	AHS 2017 freedom reconfirmation to OIE	II-7
SG42	AHS 2017 samples tested	II-7
SG43`	AHS 2016 freedom confirmation to OIE	II-7
JPW44	FSSAI milk quality surveillance	II-10
SG44	incidence of glanderss 2017/18	II-7
HLB7	Animal ID delivery mechanism	II-12A
SG45	Reconfirmation of CBPP freedom to OIE	II-7
SG46	ICAR FMD cooperating labortory units	II-7
SG47	RDDL status of active surveillance for STD	II-5
SG48	Annual Report DADF 2017/18	All
SG49	DFMD-ICAR	II-7
sg50	FMD contingency plan for outbreaks	II-7
SG51	FMD serosurveillance small ruminants 2015-17	II-7
HLB8	stunning gun for buffalo slaugher_1	II.13
HLB9	stunning gun for buffalo slaugher_2	II.14
SG52	BSE risk status reconfirmation to OIE	II-7
SG53	State wise comparison of Brucellosis seroprevalence	II-5B
JW44	Annual Report 2017-18 ICAR	I-2A
JW45	FSSAI – Annual Report 2016-17	II-8A,B&C, II-6B
JW47	Veterinary Council of India – Notification (F. No. 12-5/2015-VCI – Minimum Standards of Veterinary Education (Bachelor of Veterinary Science and Animal	III-5A&B
JW71	Indian Food Laboratory Network FSSAI Information ppt	II-1, II-12A&B
JW72	ICAR Annual Report 2017-18	II-1, II-12A&B
JW73	FSSAI Annual Report	II-8A,B&C
JW74	Veterinary Council of India – Notification (F. No. 12-5/2015-VCI – Minimum Standards of Veterinary Education (Bachelor of Veterinary Science and Animal	III-5A&B
HB1	DSPCA court enforcement details	II-13, IV-2
HB2	DSPCA plan of site	IV-13
HB3	DSPCA staff details	IV-13
HB4	DSPCA Achievements 2017	IV-13
HB5	DSPCA SOPs	IVI-13
HB7	State backgound information DAH	I-1A/B, I-7to11, II-7
HB8	Min of Commerce Export policy of ABPs No 34/2015-2020	II-4, IV-4
HB9	Import permit of Livestock products DAH	II-4
HB10	Health certificate for natural treats to the EU	IV-4
HB11	Notification S.O. 1495(E) June 2014 DAH Livestock import procedures	II-4
HB12	Notification S.O. 2666(E) October DAH Definition of Livestock products	II-4
HB13	AQCS ppt hard copy dated 21 March 2018	II-4
HLB16	Glanders Surveillance programme All States	II-5B
JW30	Delhi Agricultural Cattle Preservation Act (1994)	II-8A&C

HLB20	SOP 2665 bovine import certificate	II-4
HLB21	SOP 2337 AI occurance import conitions	II-4
HLB21	SOP 2666 import animals procedures	II-4
HLB23	SOP 510 import Guidelines and questionnaire for areas, zones & compartments	II-4
HLB24	SOP 2666 import animal products guidelines	II-4
HLB25	Universal's The Prevention of Cruelty to Animals Act 1960 etal	II-13, IV-1
SM1	vaccination schedule for poultry farm compartment	IV-8
SM2	Brief note on Institute of Veterinary Biological Products Aundh	II-7
SM3	State level Training centre, Pune	I-3
SM4	Training of Vets under ASCAD Reading Material	I-3
SM5	Baseline data on Maharahstra	I.7, I.8, I.9. I.10, III-1
SM8	Recognition of poultry compartment by GoI, DAHDF	IV-8
SM8.1	confirmation letter for compartment by DADF page 1	IV-8
SM8.1	confirmation letter for compartment by DADF page 2	IV-8
SM9	Check list for inspection of poultry compartment, AHD Maharahstra	IV-8
SM10	Allana slaughterhouse presentation	II-12A, IV-4
SM13	documentation on glanders outbreak investigation, surveillance, coop with MoH	II.5A/B
SM14	BAIF presentation	III.2
SM15	Allana all documents	II-8, IV-7, II-12A, IV-4
SM16	Veterinary Dispensary, Cahuka, Aurangabad (see also SM12)	II.9
SM18	Mahrahstra PPR-CP	II.7
SM19	AHD in Aurangabad	I.11
SM20	Veterinary Commission of Turf Authorities	III.2
SM21	AHD Certificate to Allana on disease freedom	II-7; II-5; IV-7, IV-4
SUK1	ABC-ARV programme outline	II-7
SUK2	HSI Veterinary team for ABC	II-7
JW49	OIE-PVS Evaluation and Self Study Report – Uttarakhand (2018)	I-1A&B, II-8A, B&C, II-9
JW3	Chennai Quarantine Zone Visitor Regulations	II-4
JW4	Form 25 Licence to Manufacture Drugs Directorate of Drugs Control	II-9
JW9	Order – Specifying "Minor Veterinary Services" and persons permitted to do such services under Section 30 of the Indian Veterinary Council Act (1984)	I-2A&B, IV-1
JW10	Standard of Professional Conduct, Etiquette & Code of Ethics for Veterinary	III-5A
JW11	Brief Information Re Central Semen Station, Anjora Durg, Chhattisgargh – Section 5 – Health status of bulls (a) Testing, (b) Vaccination	II-7
JW12	Brief Information Re Central Semen Station, Anjora Durg, Chhattisgargh –	I-1A&B, I-2A&B
SKA1	Baseline information on Department of AH and Veterinary Services	All
SKA2	Control Strategies for Economically Important Livestock Disease in Karnataka	II-7
SKA3	Acts and rules related to livetock disease control and AW	IV-1
SKA4	Epidemiology Report 2015-16	II-7
SKA5	Central and State Veterinary Council Act, Rules and Regulations, Vet Council	IV-1,
SKA6	Vet Council Act summary note	II-5A
SKA7	extension material on bovine and human brucellosis	II-7
SKA8	ICAR Indian Veterinary Research Institute	II-1B
SKA9	LH&DC programs in Karnataka	II-7
SKA10	NIVEDI	II-7
SKA11	DAH&VS Karnataka overview	I-1A, I-3, II-3, II-4, II-5B, II-6, II-8A II-9, III-2, III-5A
SKA12	Biovet privat Pharma company	II-9
SKA14	Institute of Animal Health and Veterinary Biologicals	II-9
SKA15	Poultry Development Organisation and Training Institute	III-6
SKA16	Veterinary Faculty	II-5
SKA17	Rabies OIE Twinning Lab	II-7
SKA18	Central Poultry Devi Org & Trg Institute 2018/19 Course calender	I-3

SKA19	Karnataka Milk Federation Nandini Sperm Station	II-12A
SKA20	Central Frozen Semen Production & Trg Institute course program	I-3
SKA21	Central Frozen Semen Production & Trg Institute overview	IV-7
SKA22	Central Cattle Breeding Farm	II-5
SKA23	Bioveti privati Pharma company product range	II-9
SKA24	Institute of Animal Health and Veterinary Biologicals Vaccines Handbook	II-1B
SKA25	ICAR-National Dairy Research Institute, Southern Regional Station	II-1B
SKA26	ICAR National Institute of Animal Nutrition and Physiology	II-1B
SKA27	AQSA quarantine and certification services	IV-4
SKA28	Sample of registration Certificate for Vet Council Karnataka	III-5A
SKA29	poultry Association presentation	I-6B
HLB14	Karnataka Vet Council	III-5A
SKA30	NIVEDI Annual report 2016/17	III-5A
JPW1	Government Veterinary Hospital Buxibazar - Information Sheet	I-7
JPW2	Revised weekly vaccination report on utilization of all vaccines of district -	I-6A,I-11,II-7
JPW3	Cuttack District report	I-5,I-11,II-5A,II-7,II-13
JPW4	Odisha State report	1-1A,I-1B,I-5A,I-5B,I-7,I-8,II-7,II-1,IV-1
JPW5	Funds released to RDDLs/CDDL - 5 years	I-8,II-1A
JPW6	Infrastructures/facilities/schemes Chikanwas	I-7
JPW9	Odisha briefing	I-6A,I-7,I-11,II-1A,II-5A,II-5B,II-6,III-5A,IV-1
JPW10	Information Sheet (1) & (2) Animal Disease Research Institute, Cuttack	I-7,II-1A,II-1B,II-5A
JPW11	Training Manual - Training programme of paravets on disease control	I-2B,I-3,II-7,III-1
JPW13	NADRS monthly bulletins Odisha	I-11,II-5A,II-5B
JPW14	Animal Birth Control - Information sheet, Bhubaneswar	I-11,II-7,II-13
JPW15	International Centre for FMD (ICFMD) Souvenir	II-1A,II-1B,II-7
JPW17	Agrovet - Layer feed: batch number, packing date	II.11
JPW18	SMILE annual report 2015/6	I-3
JPW20	OMFED milk packet - batch number and use by date	II-12B
JPW21	Chicken shop - eggs: table with packing date	II-12B
JPW22	Pasupati Feed: bag without date or batch information	II-11
JPW23	Monthly progress report (workdone) of VH Buxibazar	I-11
JPW24	Outbreak investigation kit	II-5A,II-6
JPW25	Operation register LAC	I-11
JPW26	New India Insurance Co Livestock Card, post mortem report, bank details	I-11,II-5A,III-6,II-12A
JPW27	Animal ear tag	II-12A
JPW28	Livestock demographics LAC	I-11
JPW29	Prescription form	II-9
JPW30	Pharmacy licence	II-9
JPW54	Odisha Bovine Breeding Policy, 2015	I-5
JPW56	Hospital clinic report Form 4	I-11
JPW57	Micro-Insurance Product Goat Insurance Product: Report and Policy	I-11
JPW62	Mobile veterinary clinic	I-7,II-5A
JPW64	Egg carton label with batch number and date	II-12B
JPW65	Milk packets with with batch number and date	II-12B
JPW66	Job descriptions for laboratory: Animal Disease Research Institute (ADRI)	1-1A
JPW67	Bench top records ADRI various	II-2
JPW68	Laboratory results ADRI	II-1A
JPW69	Layer feed with packing date and batch number	II-11
JPW78	Training Manual Training Programme of Paravets on Disease Control	I-2B,II-7
JW6	Order No. 584/FARD, Dt. 14-01-16 (13V-02/2015): Recruitment and Condition of Service (Amendment Rules) (2015) Enhancement of training period of	I-2B

JW7	Revised Syllabus - For Training of Livestock Inspector (Paravets) 2 year	I-2B
JW13	Assessment of Core Competencies of Livestock Extension Professionals in	I-2A, I-3
JW14	Improving the delivery of Veterinary Services in India (Rev. Sci. Tech. Off. Int.	I-1A&B, I-2A&B, I-3
JW15	Performance Evaluation of Veterinary Services in Odisha by DIE, Animal	I-1A&B
JW17	Information Sheet - ABC Programme - Bhubaneswar Municipal Corporation (2	II-13
JW18	Information Sheet - Veterinary Dispensary / Polyclinic, Shaheednagar,	I-1A&B, I-11, II-7
JW19	Centre for Wildlife Health, College of Veterinary Science and Animal Husbandry, Orissa University of Agriculture and Technology	II-1A, II-5B
JW34	The Orissa Cattle and Poultry Feed (Regulation) Act 1979	II-11
JW37	Performance Evaluation Veterinary Services in Odisha by DIE	I-1A&B; I-2A&B, I-3
JW38	DSPCA Staff Strength, Achievements of the SPCA 2017-18, Statement of Challans issued by DSPCA officers April 2017 to January 2018-	II-13
SRA1	State Background information	II=7, I-1A&B, II-13
SRA2	Disease Diagnostic Unit Annual Report 16/17	II-7
SRA3	Disease Diagnostic Unit Annual Report 12/13	II-7
SRA4	ICAR- Central Sheep and Wool Research Station Annual Report 16/17	II-7
SRA6	All India Marwari horse society	II-13
SRA7	Rajasthan country presentation	I-1A&B, II-13
JPW7	Haryana Veterinary Training Institute	I-2B, I-3
JPW8	Haryana briefing	I-6A
JPW16	ICAR-NRCE: annual report and Vision 2050	II-1A, III-5A, II-; III-2
JPW58	Organisational chart NRCE	I-11
JPW59	Livestock Population chart (village)	I-11, I-5A/B
JPW60	Drug prescription form	II-9
JPW61	NRCE Glanders cases 2017-18	I-5A
JPW63	Goshalla Veterinary ambulance	I-7, II-4, II-13
SH1	Veterinary Type Culture Collection	II-1A,
SH2	ICAR-Central Institute for Research on Buffaloes	II-1A
SH3	Haryana baseline information	I-1A
SH4	Annual Report 2016/17, Luvas	I-2B
SH5	Luvas Newsletter June 2017	I-2B
SH5	Haryana State Laboratory	II-1A&B
SH6	State presentation	I-1A&B
SH7	FMD sero monitoring pre and post 2014/15 and 15/16	II-5B, II-7
SGU1	State Frozen Semen Production & Trg Institute, Patan	II-5
SGU2	overview of livestock sector Gujarat	I-1A/B, II-13
SGU3	Gujarat State AHD presentation	II-5A/B, II-13, II-12A
SGU4	flyer on INAPH, produced by NDDB	II-12A
SGU5	Animal disease surveillance report 2016/17	II-5B
SGU6	Schemes for assistance to Gaushallahs	II-13
SGU7	Brooke program in Meerut	II-13
SGU8	Anand District of Gujarat AHD	II-5B, II-7
SGU9	AHD in Vadodara Region of Gujarat	II-5B, II-7
SGU10	NDDB Anand	II-12A; II-6
SGU11	Notes on emergency service 1962	II-13
SGU12	GVK EMRI Gurjarat	II-5, II-13
HLB17	Rabies vaccination passports	II-7
HLB18	Animal Health Card FMD vaccination	II-7, II-12A
SUP1	EDFZ recognition	IV-7
SUP2	Application for regionalisation of the EDFZ to EU	IV-7
HLB15	Export meat cert Al Faheem	IV-4
SUP3	UP State presentation	III-1

SUP4	Monthly animal disease report	II-5
SUP5	IDSR of MoH	II-7; III-2
SUP6	NSP results for UP 2016/17	II-7
SUP7	NSP results for UP 2017/18	!!-7
HUP8	new Animal health card	II-12A
SUP8	Poultry development initiative UP	III-6
JW39	www.firstpost.com/india/up-slaughterhouse-crackdown	II-8A,B&C
HP1	Shimla Epi data	II-5A&B,II-7
HP2_	State presentation	I-1A&B,all
HP3	State background Info	I-1A&B
HP4	notification dated 25-07-2010 treatments authorised for para-vets	I-2B
HP5	Brief profile KAMDHEMU coop dairy Brief profile KAMDHEMU coop dairy	II-8CII-10,III-12B
HP6	Jaipur Training calender 2018-19 for LSA and AI refresher Courses	I-2B
HP7	Jaipur Training Institute BASSI CHAKI 1st and 2nd years subject courses	I-2B
SCH1	UT presentation general	I-1A&B,all
SCH2	UT presentation ppt for meeting	I-1A&B
SP1	State presentation	I-1A&B,all
SP2	vaccination cards of buffalo purchased by MKU Overseas	I-12A,III-7
SP5	Admas sampling frame for Punjab	II-5B
SP6	Vet Polyclinic Ludhiana	I-1A&B,III.1A&B
JPW85	Sero-surveillance for FMD report	II-5B,III-7
JPW87	Vaccine Status Report	I.11,III-7
JPW88	Village-wise deworming report	I.11,III-8
JPW89	Memo notifying of FMD vaccination round	I-11,III-7
JPW90	TMR feed bag no date or batch	II-11
JPW38	Veterinary Biological & Research Institute, Labbipet Brief Note	II-1A,III-1B
JPW39	Veterinary Biological & Research Institute, Labbipet Annual Report	II-1A,III-1B
JW27	Information leaflet - Model Dairy Private ltd., Vijayawada, Andra Pradesh	II-8A,B&C
JW28	Information Brief Note - Krishna Milk Union, Krishna District, Andra Pradesh	II-8A,B&C
JW36	OIE PVS Evaluation of Andra Pradesh State (2018)	I-1A&B
SK1	NABL accreditation letter for State Laboratory for livestock, Marine & fisheries, Ernakulam	I-1A
SK2	minutes of a management review meeting for the State Laboratory	I-6A
SK3	Job description for a Livstock Products Inspecting Officer (LPIO) from the Quality Manual of the SLMAP	I-2A
SK4	Job description for a Lab Technician from the Quality Manual of the SLMAP	I-1B,III-1B
SK5	division of labor in SLMAP	I-1B,III-1B
SK6	State Background Information Kerala	I-1A,I-7,III-12A
SK7	FMD Investigation form Chief Disease Investigation Office, Palode	II-6
SK8	Training Manual Chief Disease Investigation Office, Palode Molecular diagnostic lab	II=7
SK9	Chief Disease Investigation office, Palode an overview	II-5B,III-5B
SK10	Publication on "Natural Rabies Infection in a Domestic Fowl"	II-7
SK11	Institute of Animal Health and Veterinary Biologicals an overview	II-9
SK12	State Institue for Animal Diseases	II-7
SK13	Televet program	II-7,II-13
SK14	Institute of Animal Health and Veterinary Biologicals ppt	II-9
SK15	Kerala Livestock Development Board, Semen Station	II-12A,
SK16	PVM Seromonitoring FMD, Kerala	II-7
SK17	DIVA results FMD	II-7
SK18	study programme Kerala University	I-2A
JPW37	Drug Hand Book for Veterinarians (GVK-EMRI)	II-9
JPW40	Law and circulars relating to protection of cows and animals in AP	IV-1,III-4,III-13

Appendix 6: Organisation of the OIE PVS evaluation of VS of India

Assessors Team:
- Team leader: John Weaver
- Technical experts: Howard Batho, Susanne Münstermann, John Woodford
- Observer/Facilitator: Caitlin Holley, John Stratton

References and Guidelines:
- Terrestrial Animal Health Code (especially Chapters 3.1. and 3.2.)
- OIE PVS Tool for the Evaluation of Performance of VS
  - → Human, financial and physical resources,
  - → Technical capability and authority,
  - → Interaction with stakeholders,
  - → Access to markets.

Dates: Mission 1 – 19/2/18-9/3/18; Mission 2 – 11/4/18-2/5/18

Language of the audit and reports: English

Subject of the evaluation: VS as defined in the Terrestrial Animal Health Code
- Not Inclusive of aquatic animals
- Inclusive of other institutions / ministries responsible for activities of VS

Activities to be analysed: All activities related to animal and veterinary public health:
- Field activities:
  - → Animal health (epidemiological surveillance, early detection, disease control, etc)
  - → quarantine (all country borders),
  - → veterinary public health (food safety, veterinary medicines, residues, etc)
  - → control and inspection
- Data and communication
- Diagnostic laboratories
- Research
- Initial and continual training
- Organisation and finance
- Other to be determined…

Sites to be visited/persons to be present: see Appendix 3

Procedures:
- Consultation of data and documents
- Comprehensive field trips
- Interviews and meetings with VS staff and stakeholders,
- Analyse of practical processes

Provision of assistance by the evaluated country
- Completion of missing data as possible
- Translation of relevant document if required
- Administrative authorisation to visit designated sites
- Logistical support if possible

Reports:
- A fact sheet or powerpoint will be presented at the closing session
- A report will be sent to the OIE for peer-review no later than one month after the mission
- The current levels of advancement with strengths, weaknesses and references for each critical competence will be described,
- General recommendations may be made in agreement with the VS.

Confidentiality and publishing of results
The results of the evaluation are confidential between the country and the OIE and may only be published with the written agreement of the evaluated country.