

# WOAH Reference Laboratory Reports Activities 2022

## Activities in 2022

This report has been submitted : 9 mars 2023 11:05

### Laboratory Information

<b>Name of disease (or topic) for which you are a designated WOA Reference Laboratory:</b>	Avian influenza
<b>Address of laboratory:</b>	ICAR National Institute of High Security Animal Diseases Anand Nagar Bhopal 462022 (M.P.) INDIA
<b>Tel.:</b>	+91 755 2759204
<b>E-mail address:</b>	ctosh@hsadl.nic.in
<b>Website:</b>	http://nihsad.nic.in
<b>Name (including Title) of Head of Laboratory (Responsible Official):</b>	Dr. V.P. Singh, Director (up to 22nd Sep 2022), Dr. A. Sanyal, Director (from 23rd Sep 2022)
<b>Name (including Title and Position) of WOA Reference Expert:</b>	Dr. Chakradhar Tosh, Principal Scientist
<b>Which of the following defines your laboratory? Check all that apply:</b>	Autonomous body

### TOR1: DIAGNOSTIC METHODS

1. Did your laboratory perform diagnostic tests for the specified disease/topic for purposes such as disease diagnosis, screening of animals for export, surveillance, etc.? (Not for quality control, proficiency testing or staff training)

Yes

Diagnostic Test	Indicated in WOA Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
HI	YES	2549	0
AGID	YES	4992	0
Direct diagnostic tests		Nationally	Internationally
RT-PCR	YES	9247	0
Real time RT-PCR	YES	36989	

			0
Virus Isolation	YES	816	0
Nucleotide sequencing	YES	14	0

## **TOR2: REFERENCE MATERIAL**

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by WOA?H?

No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOA?H Members?

No

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOA?H Members?

No

## **TOR3: NEW PROCEDURES**

6. Did your laboratory develop new diagnostic methods for the designated pathogen or disease?

No

7. Did your laboratory validate diagnostic methods according to WOA?H Standards for the designated pathogen or disease?

No

8. Did your laboratory develop new vaccines for the designated pathogen or disease?

Yes

9. Did your laboratory validate vaccines according to WOA?H Standards for the designated pathogen or disease?

Yes

NAME OF THE NEW VACCINE DEVELOPED	DESCRIPTION AND REFERENCES (PUBLICATION, WEBSITE, ETC.)
Inactivated low pathogenic avian influenza (H9N2) vaccine for chickens	Director, ICAR-National Institute of High Security Animal Diseases, Hathaikhed Road, Anand Nagar, Bhopal -462 022 (M.P.), India

## **TOR4: DIAGNOSTIC TESTING FACILITIES**

10. Did your laboratory carry out diagnostic testing for other WOA?H Members?

No

11. Did your laboratory provide expert advice in technical consultancies on the request of an WOA?H Member?

No

## **TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES**

12. Did your laboratory participate in international scientific studies in collaboration with WOA?H Members other than the own?

No

## **TOR6: EPIZOOLOGICAL DATA**

14. Did your Laboratory collect epidemiological data relevant to international disease control?

Yes

IF THE ANSWER IS YES, PLEASE PROVIDE DETAILS OF THE DATA COLLECTED:

Information on avian influenza viruses isolated including their origin, subtype and nucleotide sequences of HPAI and LPAI viruses in India.

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

Yes

IF THE ANSWER IS YES, PLEASE PROVIDE DETAILS OF THE DATA COLLECTED:

The information was analyzed and the reports submitted to Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

16. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category and list the details in the box)

a) Articles published in peer-reviewed journals:

05

a) Verma AK, Manoj Kumar, Murugkar HV, Nagarajan S, Tosh C, Namdeo P, Singh R, Mishra S, Kombiah S, Senthilkumar D, Singh VP (2022) *Experimental Infection and In-Contact Transmission of H9N2 Avian Influenza Virus in Crows*. *Pathogens* 11(3) 304, DOI: 10.3390/pathogens11030304.

b) Boruah JLH, Venkatesh G, Nagarajan S, Senthilkumar D, Bhatia S, Tosh C, Manoj Kumar, Rai R, Tripathi S, Shukla S, Dubey CK, Singh VP (2022) *Immunogenicity and cross-protective efficacy of recombinant H5HA1 protein of clade 2.3.2.1a highly pathogenic H5N1 avian influenza virus expressed in E. coli*. *Microb Pathog.* 168:105605, DOI: 10.1016/j.micpath.2022.105605.

c) Mishra A, Asaf M, Amod Kumar, Kulkarni DD, Sood R, Bhatia S, Bharat Bhushan, Raut AA (2022) *Differential miRNA expression profiling of highly pathogenic avian influenza virus H5N1 infected chicken lungs reveals critical microRNAs, biological pathways and genes involved in the molecular pathogenesis*. *Virol Sin.* 37(3): 465- 68, DOI: 10.1016/j.virs.2022.03.004

d) Panickan S, Bhatia S, Bhat S, Bhandari N, Pateriya AK, Kalaiyarasu S, Sood R, Tripathi M (2022) *Reverse genetics based H5N2 vaccine provides clinical protection against H5N1, H5N8 and H9N2 avian influenza infection in chickens*. *Vaccine.* 40 (48): 6998-7008, DOI: 10.1016/j.vaccine.2022.10.018

e) Vijayakumar P, Raut AA, Chingtham S, Murugkar HV, Kulkarni DD, Sood R, Singh VP, Mishra A (2022) *Proteomic analysis of differential expression of lung proteins in response to highly pathogenic avian influenza virus infection in chickens*. *Arch Virol.* 167(1):141-152, DOI: 10.1007/s00705-021-05287-5

b) International conferences:

03

a) A.K. Verma, Manoj Kumar, H.V. Murugkar, S. Nagarajan, C. Tosh, P. Namdeo, R. Singh, V.P. Singh (2022) *Experimental infection and in-contact transmission of highly pathogenic avian influenza H5N1 virus in crows*. *International Veterinary Pathology Congress 2022, XXXIX Annual Conference of Indian Association of Veterinary Pathologists and XIII Annual Meeting of Indian College of Veterinary Pathologists and International Symposium on "Global Challenges in rapid diagnosis and management of animal and poultry diseases for improved health and productivity"*, 17th to 20th November, 2022, pp285.

b) P. Boopathi, Manoj Kumar, H.V. Murugkar, S. Nagarajan, C. Tosh, D. Senthilkumar, S. Kalaiyarasu, S. Gautam, Sivasankar Panickan and

V.P. Singh. (2022) Pathology of H5N8 avian influenza virus in experimentally infected chicken. International Veterinary Pathology Congress 2022, XXXIX Annual Conference of Indian Association of Veterinary Pathologists and XIII Annual Meeting of Indian College of Veterinary Pathologists and International Symposium on "Global Challenges in rapid diagnosis and management of animal and poultry diseases for improved health and productivity", 17th to 20th November, 2022, pp232.

c) Nagarajan S (2022) Epidemiology of Influenza Viruses in Animals and Birds. Invited lecture delivered in International Webinar on "World Flu Day" organized by Manipal Institute of Virology, MAHE, Manipal, 2nd November, 2022.

c) National conferences:

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a) Tosh C (2022) Transmission dynamics of avian influenza. Invited lecture presented in the workshop "Spatial and temporal modelling of zoonotic diseases using R", ICAR-National Institute of High Security Animal Diseases, Bengaluru, Karnataka, 26th July 2022.

b) Nagarajan S, Tosh C, Manoj Kumar, Murugkar HV, Singh VP (2022) Avian influenza: A One Health Challenge. Invited lecture delivered in 14th Kerala Veterinary Science Congress- 2022, with focal theme "One Health Approaches in Management of Animal Health Care – New Paradigms", hosted by the Kerala Veterinary and Animal Sciences University in a hybrid mode, at College of Veterinary and Animal Sciences, Mannuthy, Kerala, 12th to 13th November, 2022.

c) Nagarajan S (2022) Prevention and control of emerging and exotic viral diseases of livestock. Invited lecture delivered in National Webinar 'Advances in Veterinary Sciences during 75 years of Indian Independence (1947-2022)' jointly organized by ICAR-National Institute of High Security Animal Diseases, Bhopal and Dr. C.M. Singh Endowment Trust (CMSET), Bareilly, Uttar Pradesh as part of Dr. C. M. Singh Birth Centenary Year Celebrations, 31st October, 2022.

d) Nagarajan S, Kumar M, Venkatesh G, Murugkar HV, Tosh C (2022) Highly pathogenic Avian Influenza in native chickens – Control vs conservation. Invited lecture delivered in National Conference on Native Chicken on 'Relevance of Climate Smart Traditional Farming Systems in the Era of Omics' at Madras Veterinary College, Chennai, Tamil Nadu, 22nd and 23rd September, 2022.

e) Tosh C, Nagarajan S, Manoj Kumar, Murugkar HV, Singh VP (2022) Vaccination against H9N2 low pathogenic avian influenza – pros and cons. Invited lecture, In: VIROCON 2021, National Conference of Virology (virtual Mode) on "Emerging and Reemerging Viral Diseases – Climate Change Impacts and Mitigation" Organized by AIIMS, Hyderabad, Telangana, India, 26th to 28th March 2022.

f) Nagarajan S (2022) Laboratory Biosafety and Biosecurity for handling of Avian Influenza viruses in a BSL3 facility. Invited lecture delivered at training programme on "Biosafety and Biosecurity Capacity Building: One Health Perspective" organized by TANUVAS-Biocontainment Animal Disease laboratory, Chennai, 7th and 20th January, 2022.

d) Other (Provide website address or link to appropriate information):

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1) Tosh, C., Nagarajan, S., Manoj Kumar, Murugkar, H.V., Singh, V.P. (2022) avian influenza - prospects for vaccination in disease control. NAVS News Vibes, Vol 2 (2): 3.

2) Transfer of H9N2 vaccine technology (<https://nihsad.nic.in/>)

## TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOA H Members?

No

## TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
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ISO 17025	pdf	Certificate TC-8541.pdf
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19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Real time RT-PCR	National Accreditation Board for Testing and Calibration Laboratories

20. Does your laboratory maintain a "biorisk management system" for the pathogen and the disease concerned?

Yes

The laboratory is a certified BSL3 biocontainment laboratory and has a robust biorisk management system to handle the pathogens

## TOR9: SCIENTIFIC MEETINGS

21. Did your laboratory organise scientific meetings related to the pathogen in question on behalf of WOA?

No

22. Did your laboratory participate in scientific meetings related to the pathogen in question on behalf of WOA?

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
OFFLU wild bird experts group zoom call	2022-01-12	OFFLU Network (Virtual mode)	Participation in discussion	Discussion
Managing large-scale highly pathogenic avian influenza (HPAI) outbreaks in wild birds	2022-02-10	OFFLU Network (Virtual mode)	Participation in discussion	Discussion
OFFLU Pre-VCM February 2022 data discussion	2022-01-28	OFFLU Network (Virtual mode)	Participation in discussion	Discussion
South Asia avian disease meeting	2022-07-05	WOAH RRAP (Virtual mode)	Speaker	Avian disease situation in India
WOAH Regional Avian Disease Expert Group Network Meeting for Asia and the Pacific	2022-10-31	Geelong, Australia	Speaker	Activities of Avian Influenza Reference Laboratory, India
FAO meeting on Better detection, better response: A regional consultation on avian influenza surveillance in Asia	2022-11-02	Geelong, Australia	Participation in discussion	Discussion
OFFLU call for avian influenza and wild bird situation update	2022-12-05	OFFLU Network (Virtual mode)	Speaker	Avian influenza situation in poultry and wild birds- India (Asia)

## TOR10: NETWORK WITH WOA REFERENCE LABORATORIES

23. Did your laboratory exchange information with other WOA Reference Laboratories designated for the same pathogen or disease?

No

24. Are you a member of a network of WOA Reference Laboratories designated for the same pathogen?

No

25. Did you organise or participate in inter-laboratory proficiency tests with WOA Reference Laboratories designated for the same pathogen?

No

26. Did your laboratory collaborate with other WOA Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

No

## **TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING**

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOA Reference Laboratories for the same pathogen?

Yes

Purpose for inter-laboratory test comparisons <sup>1</sup>	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Region(s) of participating WOA Member Countries
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Regional Proficiency Testing Program 2020b

- repeat Avian PCR. CSIRO-ACDP, Australia  
(2022)

Participant

Asia and Pacific

## **TOR12: EXPERT CONSULTANTS**

28. Did your laboratory place expert consultants at the disposal of WOA?

No

29. Additional comments regarding your report:

No