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中华人民共和国农业农村部
Ministry of Agriculture and Rural Affairs of the People's Republic of China

Workshop Report

Regional Workshop on Zoonotic Tuberculosis and Brucellosis Control in the Asia Pacific Region

Qingdao Sophia Hotel, Qingdao, China P.R., 24-26 September 2024

Organised jointly by:

WOAH Regional Representation for Asia and the Pacific (WOAH RRAP) and the China Animal Health and Epidemiology Centre (CAHEC), Ministry of Agriculture and Rural Affairs, People's Republic of China

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Executive Summary

The WOAH Regional Representation for Asia and the Pacific (WOAH RRAP) and the China Animal Health and Epidemiology Centre (CAHEC) organized a regional workshop on zoonotic tuberculosis (zTB) and brucellosis at Qingdao, China P.R. on 24-26 September 2024. The workshop was funded by the Ministry of Agriculture and Rural Affairs (MARA) of the People's Republic of China.

A total of 50 participants, including 20 government representatives from 19 Members (Australia, Bangladesh, Cambodia, China P.R., Fiji, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, Nepal, New Zealand, New Caledonia, Papua New Guinea, Sri Lanka, Thailand, Vanuatu, Vietnam) and local observers attended the workshop. Experts from WOAH Reference Laboratories and Collaborating Centres from China P.R., Japan and Thailand supported the workshop. The China Animal Health and Epidemiology Centre (CAHEC) under the Ministry of Agriculture and Rural Affairs (MARA) of the People's Republic of China provided logistics support for the workshop.

This workshop shared updates on disease epidemiology, advances in diagnostics, vaccines, and best practices on zTB and brucellosis, providing opportunities for networking and exploring available support to address gaps and challenges in countries.

Globally, tuberculosis (TB) was the second leading infectious disease killer after COVID-19 in 2022, with an estimated 1.3 million deaths. Nearly 90% of all human TB cases occur in South Asia, East Asia, Southeast Asia, and the most populous countries in Africa. Bovine tuberculosis (bTB), caused primarily by *Mycobacterium bovis*, poses a significant zoonotic threat, especially in developing countries where control measures are inadequate. Zoonotic TB (zTB) in humans, often caused by *M. bovis*, is underdiagnosed and underreported, posing serious public health challenges. Despite an estimated 140,000 new zTB cases annually, underreporting and diagnostic challenges persist. The workshop emphasized the need to improve awareness and implementation of the 2017 Roadmap for Zoonotic Tuberculosis, aligning with One Health mechanisms.

Brucellosis is another neglected zoonotic disease that remains endemic in many lower and middle-income countries, causing significant economic losses due to reduced livestock production and human health costs. Studies in India and Indonesia highlight the substantial economic impacts of brucellosis on livestock and human health, further contributing to the spread of the disease, particularly at the animal-human interface.

The sessions of this workshop allowed for discussions on zTB and brucellosis prevalence, surveillance, and control efforts in Asia-Pacific countries. Bovine TB (bTB) and brucellosis eradication successes were noted in Japan, while New Zealand, Australia, and New Caledonia successfully maintain disease freedom from brucellosis. Other countries face challenges such as limited surveillance, constrained budgets, and competing priorities to successfully implement control programs for these diseases. The workshop also highlighted the spread of *M. bovis* and *M. orygis* among humans, wild, and domestic animals in several countries in the region. Challenges included a lack of validated diagnostic kits, high cold storage costs, and the need for vaccine validation for both diseases. Updates on diagnostics included advancements in serological, molecular, and bacteriological methods for brucellosis, and rapid TB diagnosis methods like the Xpert MTB/RIF Ultra assay, noted for high sensitivity and specificity. Key findings highlighted the importance of serological, molecular, and bacteriological diagnostic methods, improved vaccine production, and compensation for affected farmers. The need for a globally connected research community and tailored regional strategies was emphasized.

International cooperation and a One Health approach were also mentioned as key components for successfully controlling zTB and brucellosis.

Main recommendations during the workshop included capacity building to enable countries to develop and implement robust surveillance systems, advocacy for political and financial commitments, public education, and stakeholder coordination—particularly between animal and human health sectors. Certification of disease-free zones, effective movement control and traceability, compensation mechanisms, and maintaining technical expertise are crucial for effective disease control, eradication, and maintenance of disease-freedom. Additionally, the significance of science-based guidelines tailored to diverse contexts, promoting modern diagnostic technologies, and laboratory strengthening was emphasized.

In conclusion, addressing zTB and brucellosis requires concerted efforts and collaboration across sectors. The insights and recommendations from this workshop highlight the critical need for strengthening surveillance systems, improving diagnostics and vaccines, and fostering international cooperation. By implementing a One Health approach and supporting countries in overcoming their challenges, we can move towards the effective control and eradication of these significant zoonotic diseases, protecting both animal and human health.

The workshop was very well received by the participants with more than 90% of the responders rating as “overall satisfied” and more than 95% rating the workshop as having high impact to their knowledge on zTB and brucellosis.

Acronyms and abbreviations

AHAs: Animal Health Authorities
AP: Asia Pacific
BB: Bovine Brucellosis
bTB: Bovine Tuberculosis
CAHEC: China Animal Health and Epidemiology Centre
CDC: Centers for Disease Prevention and Control
CFT: Complement Fixation Test
CFTT: Caudal fold tuberculin test
CNP: Chitwan National Park
DALYs: Disability Adjusted Life Years
ELISA: Enzyme-Linked Immunosorbent Assay
FAO: Food and Agriculture Organization of the United Nations
HQ: Headquarters
IVDC: China Institute of Veterinary Drug Control
MAFF: Ministry of Agriculture, Forestry and Fisheries
MARA: Ministry of Agriculture and Rural Affairs of China P.R.
MTBC: *Mycobacterium tuberculosis* complex
NAP: National Action Plans
NKV: National Certification of Animal Health
NTPs: National Tuberculosis Programmes
NVL: National Veterinary Laboratory
OIE: World Organisation for Animal Health (former name)
PPD-B: Purified Protein Derivative-Bovine
RBT: Rose Bengal Test
RRAP: WOAH Regional Representation for Asia and the Pacific
STAR-IDAZ IRC: Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animal Zoonoses
SWOT: Strengths, Weaknesses, Opportunities, and Threats
TB: Tuberculosis
WAHIS: World Animal Health Information System of WOAH
WHO: World Health Organization
WOAH: World Organisation for Animal Health
zTB: Zoonotic Tuberculosis

Event overview

Globally, as per the WHO Global Tuberculosis Report of 2023, in 2022, Tuberculosis (*Mycobacterium tuberculosis*) was the second leading infectious human disease killer after COVID-19 and an estimated 1.3 million people died of the disease. Nearly 90% of all human TB cases are located in South Asia (India, Bangladesh, Pakistan), East Asia (China), Southeast Asia (Philippines, Indonesia) and, the most populous countries in Africa (South Africa and Nigeria).

Bovine tuberculosis (bTB) is a chronic bacterial disease of animals caused by members of the *M. tuberculosis* complex primarily by *M. bovis*, but also by *M. caprae* and to a lesser extent *M. tuberculosis*. It is a major zoonotic disease, and cattle are the main source of infection for humans. It also affects other domesticated animals such as sheep, goats, equines, pigs, dogs and cats, and wildlife species such as wild boars, deer and antelopes. Bovine tuberculosis remains a serious problem for animal and human health in many developing countries, including parts of Asia reporting high prevalence. Zoonotic tuberculosis (zTB) is a form of tuberculosis that is transmitted from animals to humans, mainly through consumption of raw or undercooked animal products, contact with infected animals or their secretions, or inhalation of aerosols.

Zoonotic TB (zTB) is a form of TB in people predominantly caused by a closely related species, *M. bovis*, which belongs to the *M. tuberculosis* complex (MTBC) which includes several species that can infect humans and animals. The most common cause of zTB is *M. bovis*, which is also responsible for bovine tuberculosis (bTB) in cattle and other domestic and wild animals. zTB poses a serious threat to public health and animal health, especially in low- and middle-income countries where the disease is endemic, and control measures are inadequate. zTB is often underdiagnosed and underreported, due to the lack of awareness, resources, and diagnostic tools. zTB can also be resistant to some of the first-line anti-TB drugs, making the treatment more difficult and costly.

The current status and needs for zoonotic tuberculosis are summarized in the Roadmap for Zoonotic Tuberculosis, which was published in 2017 by the World Health Organization (WHO), the Food and Agriculture Organization of the United Nations (FAO), the World Organisation for Animal Health (WOAH), and the International Union Against Tuberculosis and Lung Disease (The Union). The roadmap outlines ten priorities for addressing the existing challenges posed by zTB, divided into three major core themes: (1) Improve the scientific evidence, (2) Reduce transmission at the animal-human interface, and (3) Strengthen intersectoral and collaborative approaches. The roadmap calls for concerted action through broad engagement across political, financial and technical levels, including government agencies, donors, academia, non-governmental organizations and private stakeholders. The roadmap also provides a framework for monitoring and evaluating the progress and impact of the interventions.

Of the 10 million people currently infected with new active TB, 140,000 are estimated to be new cases of zTB (1.4%) of which an approximately 11,400 (8.1%) died. However, zTB disease is largely underreported and, these wide ranges are indicative of major diagnostic challenges and poor public health surveillance and reporting structures in endemic countries. To support the Roadmap for Zoonotic Tuberculosis and as a call for action to tackle zTB in people and animals, WOAH has developed guidelines for alternative strategies for TB control in livestock. The objective of these guidelines is to provide alternative strategies for controlling *M. tuberculosis* complex infection in livestock.

Brucellosis is a neglected zoonotic disease of economic importance that is endemic in most of the lower and middle-income countries in the world including the Asia Pacific Region. Important species affecting food animals include *Brucella abortus* in cattle, *B. melitensis* in small ruminants, and *B. suis*

in pigs. Besides being an occupational hazard for people working with animals such as livestock farmers, veterinarians, abattoir workers, laboratory workers, etc. through direct contacts, the disease can be transmitted indirectly to humans via consumption of non-pasteurised milk, and milk products. Brucellosis can result in economic losses in terms of reduced production due to infertility, abortions, decreased milk production, and costs for prevention, control, and elimination. The WOAH's world animal health information system (WAHIS) report for 2019 shows that the disease has been officially reported to be present in animals in most of the 32 WOAH Members in the region. A study in India in 2015 showed the disease caused a loss of US $ 3.4 billion in total of which losses in cattle and buffalo industries accounted for 95.6% of the total losses. Human brucellosis is one of the most common zoonoses reported worldwide with estimated annual cases up to 500,000. Another study in India in 2018 showed an estimated annual median loss of about US $ 10.46 million and a loss of 177,601 disability adjusted life years (DALYs) at the rate of 0.15 DALYs per thousand persons per year. Likewise, the disease continues to result in significant economic losses in livestock production and human health costs in the other countries in the Asia Pacific Region. In Indonesia, a study in 2018 reported that brucellosis resulted in loss of up to 1.8% of the total value of livestock assets. Besides domestic animals, the disease has been reported in wild animals such as camels, Asian badgers, Himalayan marmots, and blue sheep although the role of wildlife in the disease epidemiology is still not clearly understood. A few countries have also reported changes in the dominance of Brucella species such as *B. melitensis* dominating over *B. abortus*. In several workshops/meetings organised by WOAH, including the Tripartite-led zoonoses workshops (multisectoral coordination mechanisms), countries have identified brucellosis as one of the priority diseases in their Members.

The WOAH Regional Representation for Asia and the Pacific (WOAH RRAP) supported by the WOAH Reference Laboratories for Brucellosis in China and Thailand organised the OIE Webinar on Progress and Challenges in Brucellosis Control in the Asia Pacific Region in 2021 wherein key updates and challenges in brucellosis control were discussed. This was followed by the "Virtual Workshop on Brucellosis Control in the Asia Pacific Region" organised jointly by WOAH RRAP, WOAH Collaborating Centre for Food Safety, Rakuno Gakuen University, Japan, and WOAH Reference Laboratories for Brucellosis based in Thailand, South Korea and Italy. These workshops recommended that WOAH and its Reference Laboratories continue to engage its Members in understanding the progress, gaps, and challenges faced in brucellosis control in the region so that appropriate support may be provided to countries. Therefore, a regional workshop on zTB and Brucellosis was jointly planned by WOAH RRAP in collaboration with the China Animal Health and Epidemiology Centre (CAHEC) – WOAH Collaborating Centre. The workshop provided the opportunity to share the latest updates in disease epidemiology worldwide and regionally, advances in diagnostics and vaccines, good practices, and opportunity for networking between countries and experts working on zTB and brucellosis. The workshop was also expected to provide information on gaps and challenges faced by Members in the Asia Pacific Region for WOAH and its partners to follow up with each Member for necessary support and collaboration.

Objectives

The Regional Workshop on Zoonotic Tuberculosis and Brucellosis Control in the Asia Pacific Region was organized with the following objectives:

1. Share updates on regional disease situation, progress and challenges in zTB and animal brucellosis control in the Asia Pacific (AP) Region.
2. Share experiences, good practices and learn from each other on the disease surveillance and control options used in the Asia Pacific Region and elsewhere.

3. Discuss ongoing capacity building support for zTB and brucellosis diagnosis, surveillance and control and identify priority areas or way forward to expedite control and elimination of these two diseases from the region.

Summary of country and technical presentations

Session 1.2 WOAH Standards and situation analysis of Zoonotic Tuberculosis (zTB)

The three presentations highlighted the importance of a One Health approach to effectively control zoonotic tuberculosis (zTB) and bovine TB (bTB). Dr. Monal Daptardar from WOAH emphasized WOAH's contributions in implementing the roadmap for zTB, including replacement of the bovine and avian tuberculin, alternative bTB control methods, and research coordination with STAR-IDAZ. Dr. Yasuhiko Suzuki from Hokkaido University pointed out underreporting of zTB and stressed the need for strengthened surveillance systems. The presentation by Dr. Corinne Merle of WHO on the review of the roadmap for zTB concluded a lack of awareness of the zTB Roadmap (only 27% of National TB Programmes (NTPs) and 64% of Animal Health Authorities (AHAs) were aware of it. Financial and laboratory capacity challenges persist, but current activities to strengthen One Health mechanisms may help address zTB and bTB challenges and encourage a more integrated response from human and animal health. Positive developments include increased prioritization of zTB in certain countries, and operational research could inform best practices for improved zTB control.

Session 1.3 Disease diagnostics, surveillance and control

Dr. Francisco Olea-Popelka presented the Guidelines for Alternative Strategies for Controlling and Elimination of *M. tuberculosis* complex (MTBC) Infections in Livestock, emphasizing the development of science-based guidelines tailored to diverse socio-economic and cultural contexts. These guidelines consider various factors such as animal health, MTBC transmission among livestock, wildlife, and humans, and farming practices, ultimately aiming to improve MTBC and bTB prevention, detection, and control. Dr. Xiaoxu Fan from CAHEC highlighted the situation and future prospects for zTB prevention, focusing on latent TB infections in occupational groups, differential diagnosis of MTBC members, and optimization of TB control measures. CAHEC's efforts include developing reference materials, conducting various diagnostic tests, and engaging in international cooperation and risk management. Dr. Xichao Ou from China CDC presented advances in bacteriological diagnosis of TB, using modern technologies like digital PCR and whole genome sequencing, with plans to expand to targeted next-generation sequencing. Dr. Elva Borja presented on the best practices of the Fiji Brucellosis and Tuberculosis Eradication and Control (BTEC) Program. Key strategies include dairy farm

registration, ear tagging, cattle movement controls, and surveillance at farms and abattoirs, modeled after successful practices in Australia and the UK. Governance is provided by the BTEC Steering Committee, and the program emphasizes education, awareness, and data management as essential tools for progress. In less developed nations such as Nepal, TB diagnosis and control in elephants are prioritized. Additional best practices in diagnostics, surveillance, and control efforts in the Asia-Pacific region were summarized from country posters and groupwork outcomes.

Session 1.4 Country poster gallery walk for zoonotic TB

Summary findings

Zoonotic TB (zTB) is endemic in several countries within the region, while New Zealand is nearing eradication and Japan have completely eradicated the disease. Control and surveillance efforts are challenged by limited technical expertise, differing national priorities, and reduced funding in countries with low prevalence. Diagnostic resources are also limited by high test costs and restricted reagent availability. One Health coordination for zTB is currently limited by effective data management, limited public awareness, and communication between animal and human health sectors, thus slowing effective disease control and reporting.

Disease situation. zTB is present in several countries within the region, while Japan have achieved eradication, and New Zealand is close to eradication. The disease remains endemic in areas such as Fiji, Nepal, and Indonesia, highlighting a need for targeted control measures. Limited surveillance complicates a comprehensive understanding of zTB prevalence across all affected countries.

*National Action Plans (NAP)***.** Many countries have implemented NAPs and strict quarantine systems for zTB, as seen in Australia, which helps to manage and control disease spread. However, in some cases, these plans and systems need to be reviewed and reinforced. Regular reviews of roadmaps and NAPs can ensure sustained progress toward eradication goals.

Animal species affected. zTB affects various animal species, with documented cases in elephants and growing interest in understanding infections in species like monkeys in countries such as Thailand and Vietnam. Reverse zoonoses (from humans to animals) have been observed, complicating control efforts. The diversity of affected species underscores the need for a One Health approach.

Surveillance. Countries have introduced certification systems, like Indonesia's NKV Certification and Fiji's dairy farm licensing, to encourage farmer compliance in zTB control. However, in countries where

the zTB has been effectively controlled, reduced case numbers have led to decreased funding for monitoring, and countries with eradication efforts face a loss of technical expertise. Surveillance resources are also limited due to competing priorities, affecting overall effectiveness.

Diagnostics. Most countries rely on the tuberculin test for zTB diagnosis, but access to essential materials like PPD-B is challenging in low-demand areas. Financial constraints limit the use of advanced tests such as gamma interferon assay. Diagnostic limitations affect timely detection and control efforts in low-prevalence countries.

*Control options***.** zTB control is limited by low to no compensation for affected farmers, which discourages reporting and compliance. Challenges in biosecurity and movement control persist, with some farmers bypassing testing, particularly when animals exhibit symptoms. Monitoring wildlife species, like wild boar, can provide insight into disease presence in other wildlife hosts.

One Health coordination. Coordination for zTB is affected by poor data sharing, reporting, and data management across animal and human health sectors. Public awareness remains low, reducing community engagement and accurate reporting, as farmers may be unaware of zTB symptoms. Communication gaps between agriculture and health authorities also result in slow disease management.

Session 2.1 WOAH standards and situation analysis of brucellosis

Dr. Monal Daptardar from WOAH HQ updated on the global distribution of brucellosis and recent developments for the chapter on brucellosis in the WOAH Terrestrial Manual. The presentation mentioned the research coordination for brucellosis is ongoing with STAR-IDAZ. Dr. Kohei Makita from Rakuno Gakuen University, a WOAH Collaborating Centre, highlighted brucellosis as a widely spread zoonosis, noting challenges like limited funding for veterinary and public health services and the dominance of informal value chains. Dr. Makita emphasized the need for economic considerations, One Health education on risky behaviors, and tailored disease control approaches. Dr. Monaya Ekgatat from the WOAH Reference Laboratory for Brucellosis in Thailand provided a global summary of brucellosis and recent research. Suggestions for improvement included national program development, surveillance capacity building, advocacy for political and financial commitments, public education, and regional cooperation for laboratory strengthening. All presentations emphasized the importance of a One Health approach and highlighted the need for integrated, multidisciplinary efforts to effectively control brucellosis.

Session 2.2 Disease diagnostics, surveillance and control

Each presenter provided crucial findings and recommendations to enhance brucellosis diagnostics, surveillance, and control efforts in their respective countries. Dr. Manoranjon Dhar from the Department of Livestock Services, Bangladesh highlighted significant brucellosis prevalence in nearly 10% of cattle and 9% of small ruminants, using serological, molecular, and bacteriological methods for diagnosis. The country's priority is local vaccine production and address key challenges including low disease awareness and inadequate diagnostics. Dr. Reka Kanitpun from NIAH Thailand discussed the country's comprehensive surveillance efforts, including animal movement tracking, import control, and laboratory testing. Farmers receive 75% compensation for culled positive animals, with provision of DLD-certification for Brucella-free farms. Dr. Tom Couston from the Australia DAFF Offshore Program for Animal Health presented Timor-Leste's roadmap for brucellosis control which includes a pilot vaccination program in Bobonaro. Challenges include limited resources and implementing culturally appropriate culling methods. Next actions involve appointing a Brucella Management Pilot

Coordinator, developing community engagement plans, and creating a vaccination operational plan with monitoring and evaluation. Dr. Hai Jiang from the Chinese Centre for Disease Control and Prevention noted the rise in human brucellosis cases since the first recorded cases from 1980 and efforts to improve cure rates above 85% through research on treatment efficacy and safety. The National Surveillance Guideline, developed in 2005, was further updated in 2024. Dr. Liangquan Zhu from the China Institute of Veterinary Drug Control (IVDC) detailed vaccination practices, including manufacturers, production values, and safety evaluations. S2 and A19 vaccines remained as recommended for use, with ongoing research to enhance vaccine efficacy and safety. Dr. Shufang Sun from CAHEC emphasized proactive control measures, genomic insights, and provided a background on China's a five-year action plan for brucellosis control. Key recommendations from the session included financial support, stakeholder coordination, certification of Brucellosis-free zones, and effective movement control and traceability of infected animals.

Session 2.3 Country poster gallery walk for brucellosis

Summary findings

Brucellosis has been eradicated in some regional countries (e.g., Japan, New Zealand, Australia), but limited surveillance in other countries limits the estimation of disease prevalence. Veterinary expertise, diagnostics, and monitoring budgets are constrained, particularly due to competing priorities and low incidence rates. Some, but very few countries implement animal certifications as proof of disease-free status. Brucellosis control faces gaps in government buy-in, varying community awareness, and resource limitations for sustaining surveillance and vaccination initiatives.

Disease situation. Brucellosis has been eradicated in several countries, including Japan, New Zealand, Australia. It has never been reported in New Caledonia, while in Papua New Guinea (PNG) no human cases have been reported. Although brucellosis appears to have a low prevalence in other parts of the region, the lack of clear data from some countries highlights a need for better surveillance. Limited monitoring in endemic areas makes it difficult to fully assess the disease's impact and risks.

National Action Plans (NAP). Several countries conduct regular reviews of their brucellosis NAPs and roadmaps, which helps adapt strategies to current disease dynamics. However, some NAPs and quarantine measures require strengthening to improve control efforts. Ongoing evaluations ensure that national strategies remain effective and aligned with eradication goals.

Animal species affected. Brucellosis affects multiple animal species, with some countries considering vaccination to manage outbreaks in livestock. The disease primarily targets livestock animals used for livestock production and livelihood. Control efforts vary between the countries, with some implementing vaccination of priority animal species.

Surveillance. In disease free countries, low brucellosis case numbers after effective disease control programs have led to reduced funding for brucellosis surveillance, impacting the ability to maintain disease-free status. Animal health certifications in some countries are used to maintain proof of herd health, encouraging compliance among farmers. However, maintaining technical expertise and resources, particularly in countries with low disease cases, poses challenges to maintain budgets for continued disease surveillance given countries have other impending priorities.

*Diagnostics***.** Many countries have diagnostic capabilities, commonly using RBT, ELISA, or related tests for brucellosis detection. Despite this, limited financial resources restrict access to essential reagents and advanced testing. Strengthening diagnostic infrastructure could improve detection and control, particularly in high-risk areas.

*Control options***.** Brucellosis control programs often provide compensation mechanisms for affected farmers, which encourages timely reporting and compliance. Movement control remains a challenge, as some animals are sold without pre-movement testing, especially when showing signs like abortion. Vaccination is used by some countries to control brucellosis, with disease control tailored to local conditions.

*One Health Coordination***.** Brucellosis control generally benefits from better public awareness and government engagement, although awareness levels vary at the community level. Data management systems support disease monitoring but competing health priorities sometimes divert resources. Coordination between agricultural and health sectors can be improved to strengthen the One Health approach, ensuring cohesive efforts in disease prevention and control.

At the sub-regional level, each group had developed proposed action points for the control of zTB and brucellosis in their respective sub-regions. Details of the proposed actions are provided in Annexure 3.

Key outputs of the Poster Gallery Walk on Zoonotic Tuberculosis and Brucellosis.

A summary of the poster gallery walk has been explained under Sessions 1.4 and 2.3 above. The following are the key actions and proposed way forward based on the findings of the poster sessions.

Way forward: Regional level

- Expanding animal testing to cover more species. For zTB, include research/screening of MTBC in water samples
- Improved monitoring of animal/herd health status certifications relevant for animal movement
- Economic and/or cost-benefit studies on zTB and brucellosis surveillance.
- Succession plans for local expertise and human resource, particularly once a disease is eradicated in-country
- International collaboration for sharing of technical expertise, materials between countries that had successfully eradicated the disease and those that are still in the process of controlling the disease – sharing best practices
- Regular review of zTB and/or brucellosis national action plans, including negotiations on compensation mechanisms

- Support from international partners (i.e. WOAH) to negotiate and/or reduce cost of reagents and tests (e.g. gamma interferon)
- Capacity building particularly for veterinarians, field officers and farmers.
- Continued advocacy and communication of zTB and brucellosis including for policy level.
- Improve One Health coordination and collaboration on zTB and brucellosis control, with consideration of wildlife role and environment involvement and animal welfare, particularly for zTB

Details of the findings from poster sessions are provided in Annexure 2.

Session 3.1 Other initiatives, tools and best practices sharing

The session covered the most recent innovations and diagnostic initiatives in support of controlling bTB and bovine brucellosis (BB). Dr. Yasuhiko Suzuki from Hokkaido University Japan provided information on mycobacterial diseases, highlighting the spread of *M. bovis* among humans, wild, and domestic animals in Zambia, and *M. orygis* from wild and domestic animals in South Asia. The presentation emphasized the findings related to *M. orygis*, which poses a conservation challenge for the one-horned rhinoceros in Nepal, in addition to isolating from deer, blue bull. In Bangladesh, *M. orygis* was identified as a widely distributed causative agent of TB in animals, suspected to be endemic among local cattle as a maintenance host with an airborne transmission mode. Overall, *M. orygis* is endemic in South Asia, with a wide host range from humans to wildlife and suspected airborne transmission.

Dr. Mengda Liu from CAHEC discussed the WOAH laboratory twinning program on zTB, which aims to support CAHEC in achieving WOAH Reference Laboratory standards for animal tuberculosis, benefiting the Asia-Pacific region through improved diagnostic methods, easier access to reference materials, and capacity building exercises. Dr. Xiaojie Zhu from IVDC highlighted the laboratory twinning for brucellosis between IVDC and the National Veterinary Laboratory (NVL) of Pakistan, emphasizing technology transfer, pilot surveillance, and improved diagnostic skills. Dr. Latifa El Hachimi from the Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animal Zoonoses (STAR-IDAZ IRC) discussed global and regional activities on bTB and brucellosis, highlighting the need for a globally connected research community, the development of better vaccines, and tailored regional strategies. Dr. Prapaporn Srilohasin presented rapid TB diagnosis in Cynomolgus macaques, emphasizing the Xpert MTB/RIF Ultra assay's high sensitivity and specificity for detecting TB. Key challenges mentioned for the Asia-Pacific region included the lack of validated diagnostic kits, high cost of cold storage requirements, and the need for vaccine validation. The session recommended strengthening diagnostic capabilities, enhancing regional cooperation, addressing gaps in regulatory frameworks and surveillance systems, improving political and financial commitments, public education, and promoting international cooperation for effective control and eradication.

Session 3.2 Groupwork to identify regional priority actions for zTB and brucellosis control

The presentation titled "Joint Strategy for zTB and Brucellosis Control in Japan" by Dr. Yukitake Okamura from MAFF Japan highlighted Japan's joint strategy for controlling zTB and brucellosis. Japan has been free from bTB and BB since 1st April 2021, through the guidance of procedures outlined in the Terrestrial Animal Health Code. Key measures that contributed to disease freedom include stringent import quarantine procedures, passive surveillance through monitoring of abortion and

abnormal birth cases on farms, active surveillance, test and slaughter for dairy cattle and breeding bulls, with compensation of up to 80% of the estimated market price, and inspection at slaughterhouses. Farms visits include conducting both caudal fold tuberculin test (CFTT) for bTB and collection of serological samples to conduct Complement Fixation Test (CFT) for BB. The presentation emphasized that it is possible to eradicate bTB and BB using cost-effective scientific and technical approaches.

Group work on different topics such as diagnostics and surveillance, control options, one health coordination

The participants were divided by sub-regions and tasked to brainstorm in undertaking a SWOT analysis on current situation on disease diagnostics, surveillance, control and one health coordination and based on the SWOT outputs, were asked to identify priority activities to strengthen disease surveillance, control and elimination efforts for zTB and brucellosis. Details of the outputs are provided in annexure 2.

Sub-regional workplans

Based on the outputs of SWOT analysis, the participants were asked to then identify priority activities to be implemented in the future in the form of sub-regional work plans.

A summary of the work plans for each sub-region is explained below and the details are provided in annexure 3.

Work plan for South-East Asia (SEA)

The Southeast Asia group highlighted that WOAH, FAO, STAR-IDAZ, NIAHs are important supporting partners to address limited national expertise for zoonotic tuberculosis and brucellosis in the region. The guidance from the experts will be necessary for capacity building in laboratory diagnostics, initiation of risk-based joint (human and animal health) surveillance and networking, efficient disease reporting, development or review of NAPs and raising public awareness. Implementation will have to be led by national governments.

Work plan for South Asia and East Asia

The proposed workplan for the South Asia group focuses on several key initiatives including the conduct of disease prioritization, implementation of existing One Health mechanisms to facilitate discussions on specifically targeting zTB and brucellosis. The workplan also suggest exploring options

for the use of high-quality vaccines and the execution of vaccination programs for brucellosis with guidance from experts. Additionally, there will be a focus on the development of new vaccines for both brucellosis and zTB.

Work plan for the Pacific

The Pacific group proposed for countries to develop country-specific workplans in the next eighteen months to include key activities such as: laboratory twinning, establishment of mobile or fixed diagnostic laboratory capabilities, research and surveillance for wildlife reservoirs, and encouraging collaboration between human and animal health agencies. Lobbying and engagement with donors and regional partners will be essential, along with input from stakeholders and active community engagement to ensure the sustainability of the initiative. Over the next months, country-specific workplans can be developed with encouragement from regional partners such as WHO, WOAH, SPC and reference laboratories, and collaboration with local organizations and groups, including universities, government agencies, animal and human health ministries, churches, and other NGOs. These coordinated efforts aim to enhance the region's capacity to address health challenges using a comprehensive One Health approach.

Conclusion and recommendations

Conclusions

1. Zoonotic TB (zTB) and brucellosis, though important diseases of animals and humans in the Asia Pacific (AP) region, remain neglected in most WOAH Members in the AP region.
2. zTB and Brucellosis cause significant economic burden in terms of reduced animal production and trade restrictions besides posing significant public health concerns in many Members in the AP region.
3. The Veterinary Services in most Members in the AP region lack resources in terms of trained manpower, laboratory diagnostic facilities, surveillance capacities, and funding to implement effective disease detection and control measures for zTB and Brucellosis.
4. There is limited advocacy and understanding of the importance of these two diseases at the policy level in most Members due to limited resources allocated for their prevention and control.
5. There is limited investment in research for these two diseases in most Members and therefore data on disease epidemiology, risk factors, prevalences, economic impacts, and control options are limited.
6. Although "test and cull" method has been the cornerstone for successful eradication of the two diseases in Members currently free of the diseases, it is not feasible in endemic situation owing to resource limitations, socio-cultural and religious beliefs and unsuitable compensation practices.
7. As zTB and Brucellosis have significant public health implications, the use of One Health approach involving animal, human, food safety, wildlife/environment, and other sectors is crucial. However, intersectoral coordination is still insufficient for many Members in the AP region.
8. WOAH will soon publish Guidelines for Alternative Strategies for the Control and Elimination of *M. tuberculosis* complex (MTBC) Infection in Livestock.

Recommendations – for WOAH Members

1. Enhance capacity for disease detection and surveillance for zTB and brucellosis by engaging in WOAH Laboratory Twinning Programs, laboratory proficiency programs, and general capacity building activities offered by WOAH and Partners.
2. Strengthen the capacity of Veterinary Services by engaging in WOAH Performance of Veterinary Services (PVS) activities and follow-up actions.
3. Institute/implement legislations and regulations on farm registration, animal traceability, animal movement and biosecurity for prevention and control of zTB and brucellosis.
4. Develop costed and time-bound national action plans for zTB and brucellosis, in coordination with human health and other sectors.
5. Conduct routine surveillance for zTB and Brucellosis based on disease epidemiology and produce data on disease prevalence/burden, socio-economic impact and public health impact, for resource mobilisation and political support for disease control/elimination efforts.
6. Promote public-private partnerships in areas of compliance to farm biosecurity, disease reporting, disease surveillance, disease control, and compensation mechanism for "test-and-cull" method.
7. Establish national and sub-national networks/platforms including One Health collaborative mechanisms where key players/stakeholders involved in control of zTB and Brucellosis could meet regularly to discuss progress, challenges and key actions to take and maintain continuous communication and awareness on the diseases.
8. Members are encouraged to undertake disease prioritisation exercises using tools such as the US CDC's OHZDP tool or other prioritization tools and consider inclusion of zTB and Brucellosis in the exercise.

Recommendations – for WOAH, WOAH Reference Laboratories/Collaborating Centres

1. Support capacity building of WOAH Members for disease detection, surveillance and control for zTB and Brucellosis through WOAH Laboratory Twinning Programs, laboratory proficiency programs, and trainings.
2. Support strengthening of Veterinary Services through the WOAH Performance of Veterinary Services (PVS) activities.
3. Support the development of national action plans for zTB and brucellosis, in coordination with Quadripartite (FAO-UNEP-WHO-WOAH) and other Partners.
4. In coordination with Quadripartite partners, support the establishment of regional/national networks/platforms where Members can meet regularly to discuss key progress, challenges and key actions to take.
5. In coordination with Quadripartite partners, support the establishment/revitalisation of one health coordination mechanism in countries to prevent, control and eliminate zTB and brucellosis in animals and humans. This will include use of OH tools such as International Health Regulations (IHR)-PVS National Bridging Workshops (NBWs) and Multisectoral Coordination Mechanism Operational Tools (MCM-OTs) to strengthen multisectoral coordination mechanisms in countries.
6. Coordinate with Quadripartite, other Partners, and donors for resource mobilization to support disease control and elimination efforts in line with global strategies and guidelines.

ANNEXES

Annexure 1. Regional situation, gaps, challenges from the poster sessions

Priority Areas	Zoonotic TB	Brucellosis
Disease Situation	Several participating countries are zTB-free, Japan recently eradicated zTB while NZ is nearing eradication.	There are countries in the region which are free from animal brucellosis – Japan, NZ, Australia and New Caledonia. There are also no reported human cases in PNG.
	Endemic in several countries such as in Fiji, Nepal and Indonesia.	The disease appears to have low prevalence in general, although current situation is not very clear in several countries – attributed to limited surveillance.
NAP	zTB NAP available in countries and strict quarantines systems (i.e. Australia).	Regular review of roadmaps and NAPs needed by most participating countries.
	NAP and quarantine systems needs to be reviewed and strengthened	
Animal species affected	Awareness on presence of infection in elephants (*M. bovis*, and mainly *M. tuberculosis* most likely from humans – reverse zoonoses) Interest in some countries (i.e. Thailand, Vietnam) to investigate on monkeys	
Surveillance	Certifications (NKV for Indonesia, dairy farm licensing in Fiji) by vet authority encourages farmer compliance in zTB control activities	Animal health certifications available as proof of disease status for farms/herds
	Reduced cases meant reduced funding for continued monitoring & surveillance	Low cases meant lower budget allocation – resources for maintaining freedom
	Limited or loss of technical expertise particularly in countries where disease has been eradicated.	Lack of veterinary and technical expertise
	Differing/competing priorities of countries. Limited vets, human resources, financial and budget.	Other priority diseases competing for surveillance and monitoring resources
Diagnostic	Majority of countries are using tuberculin test.	Most countries have some level of diagnostic capabilities relevant for brucellosis detection. RBT, ELISA and/or are common tests among those countries.

	Challenges to access PPD-B for countries with low demand (i.e. Japan)	Limited diagnostic capabilities and financial resourcing
	Challenges on cost of reagents and tests (i.e. gamma interferon assay).	
Control options	Low or no compensation mechanisms. For wildlife, presence of TB in one wild species (such as wild boar as scavenger) can be used as indication of presence of TB in another species (i.e. wild pig and possum in NZ). Animal welfare practices are also observed in management of wildlife and pests TB maintenance hosts	Compensation mechanisms Biosecurity issues Movement control implementation - Some farmers sell without pre-movement testing, particularly when animals shows suspicious symptoms (i.e. abortion). There are also several countries which implemented vaccination. Selection of most appropriate disease control methods to implement among the options.
One Health Coordination	Challenges in reporting, data sharing and data management	Majority of countries have some form of data management system for compilation and analysis of brucellosis data – which is not the case for zTB data. Lack of data. Under reported – farmers not reporting or community not aware of the symptoms (public awareness)
	Lack of awareness – government and public, affecting buy-in from stakeholders. Lack of public awareness on risk of drinking raw milk. Communication gaps between agriculture & health services in dealing with zTB	There is better awareness and education on brucellosis, particularly at the high level – although awareness is variable at the community level

Annexure 2. SWOT and way forward for zTB and brucellosis (from group work 2).

A. SWOT: Sub-regional level

Priority Areas	Southeast Asia	South Asia	Paci¸ c
KEY STRENGTHS			
	zTB • Disease reporting - Collab. (HH, AH, WL &E). Regulation system for animal movement & disease reporting • Disease surveillance - Some countries have surveillance activities. Most have prioritized the disease • Diagnosis capacity - Laboratory diagnostic available. Isolation (TH)&molecular (MA, TH, IN, VI) & Tuberculin Skin Test for human and animal	**zTB** • 2/6 countries have good diagnostic capacity (Japan, China) • B: Basic legislations • C: 2/6 Compensation in few countries (Japan, China)	• Low to no prevalence • Surveillance and Control programme in place • Collaborative support/approach • Laboratory/ technical • Support PHOVAPS – Services network co-ordinations • geographic isolation & Biosecurity • Academic support and resource • Notifiable Disease • Traceability and movement restriction

	<u>Brucellosis</u> **Disease reporting** - Collaboration (HH, AH, WL&E) - Regulation system for animal movement & lab report **Disease surveillance** - Several countries have implemented surveillance programmes. - Most have priority of the disease **Diagnostic capacity** - Laboratory diagnostic: Available - Isolation (Thailand) & molecular (Malaysia, Thailand, Indonesia, Vietnam) - Reference lab and ISO/IEC 17025:2017 (Thailand)	**<u>Brucellosis</u>** • most have basic diagnostic capacity • basic legislations • 2/6 vaccination program in China, Mongolia. 1/6 Compensation in few countries (China)	
CURRENT SITUATION, GAPS & CHALLENGES			
Disease Situation			Possibly wildlife infection not detected
NAP	National program is available in some countries	Lack of National program	Funding for implementation – AID, industry and government, reliance
Surveillance	No standard protocol in some countries	Except Japan and China, no regular surveillance	Representative sampling (lack of coverage)
	No risk-based surveillance in some country	Limited disease reporting at national and international, and data sharing	Surveillance coverage gap and data management variable across sub-region (incomplete mustering)
Diagnostic	Different isolation capacity among labs, some countries have no sufficient diagnostic systems.	Limited diagnostic capacity in South Asia, especially field level (Nepal, Bangladesh)	Distance and accessibility (sampling and labs)

	Not updated SOPs in current situation		
	No zTB Reference Lab for this region		
	Insufficient training		
Control options	Lack of capacity & human resource	Lack of human resources, funding.	In-country expertise & training, Resourcing and personnel for activities including compliance
Priority Areas	Southeast Asia	South Asia	Paci¸ c
	Lack of cooperation from farmers due to low compensation	Movement control. Not enough compensation for compliance to test and cull	Gaps in incentives for compliance
One Health Coordination	Lack of data sharing from A & H & W & E. No joint surveillance between A, H, W, E sectors	One health coordination. Public awareness	Lack of human and animals Health integration, farmer and community awareness
OPPORTUNITIES & WAY FORWARD			
	Initiate the risk-based surveillance + joint surveillance. Harmonize the protocol for surveillance		Funding – AID, industry and government agencies, partner nations
	Strengthen the capacity of human resources & laboratory diagnostic		Lobbying Government – Economic and social benefit analysis
	Raise the awareness in reporting the disease		Stakeholder engagement
	Increase vaccine coverage (i.e. brucellosis)		Technical capacity
	Build the data management system		Research to fill knowledge gaps – Sources of infection and disease trends, response to management policies

Annexure 3. Table of proposed workplan for each sub-region.

Southeast Asia (SEA)

Activity	**Implementing Agency / Supporting Partner**	**Timeline**
• Initiate the risk-based surveillance+ joint surveillance and harmonize the protocol for surveillance	Government: Animal, Human, Environment sector	Country: Short term SEA: Long term
• Strengthen the capacity of human resource & laboratory diagnostic	Gov, WOAH, STAR-IDAZ,	Country: Short term (specific test/topic) SEA: Long term
• Raise the awareness in reporting the disease	Government, FAO	Country: Short term SEA: Long term
• Develop expertise on zTB in the region	WOAH, STAR-IDAZ	
• Support resource and budget	WOAH, FAO, Government	International agencies: Short term Government: Long term
• Develop NAP on zTB and brucellosis and initiate active surveillance	Government	
• Raise awareness (public, staff)	Government	
• Revive the social network (Brucellanet Group)	NIAH Thailand, countries	Short term

Pacific

Activity	**Implementing Agency / Supporting Partner**	**Timeline**
• Engagement and lobbying for Funding	Partner nations	Medium term
• Sharing technical expertise across nations	Universities, Government agencies, laboratories, WOAH reference laboratories, human health laboratories and experts	From now onwards
• Stakeholder and community engagement _slightly different to Brucellosis in one health (convincing that *M. bovis* is a risk	WHO, WOAH, SPC, farmer support network, ministry of Health medical research, conservation groups. NGOs (Churches and committee groups)	Develop a country specific plan over the next 18 months and update regularly

• Laboratory twinning/ Network. Facilities (mobile/fixed)	National labs and research facilities, reference laboratories	Operating already. Check and regularly update
• Research / Wildlife reservoir status (Surveillance) – evidence of absence	Universities, Crown Research Institutes, Star –IDAZ IRC	Medium/long term
• Collaboration between human & animal health agencies for One Health	All sectors	From now

South Asia

Activity	**Implementing Agency / Supporting Partner**	**Timeline**
• Conduct disease prioritization and include zTB and brucellosis	Government/WOAH/FAO/WHO	
• Use existing one health mechanism to discuss zTB /brucellosis control	One health secretariat of countries	
• Use good quality vaccine and conduct the vaccine program according to expert suggestion (only Brucellosis)	Livestock/A.H	
• Develop new vaccines (Brucellosis and zTB)	Livestock/A.H	

Annexure 4. List of Participants

	Country	Given Names	Position	Organisation
Nominated participants				
1.	Australia	Thomas Andrew John Couston	Veterinary Officer	Department of Agriculture, Fisheries and Forestry
2.	Bangladesh	Manoranjon Dhar	Director	Department of Livestock Services
3.	Cambodia	Grandy Sin	Vice Chief	General Directorate of Animal Health and Production
4.	China P.R.	Sun Shufang		China Animal Health and Epidemiology Center
5.	Fiji	Ashnita Shivani Prasad	Senior Veterinary Officer	Ministry of Agriculture
6.	Fiji	Tomasi Niuvotu Tunabuna	Minister	Ministry of Agriculture
7.	Indonesia	Puttik Allamanda	Veterinary Officer	Disease Investigation Center, Subang
8.	Japan	Yukitake Okamura	Deputy Director	Ministry of Agriculture, Forestry and Fisheries
9.	Laos	Kethsana Inthavong	Veterinarian officer	Department of Livestock and Fisheries, MAF
10.	Malaysia	Shahaza Binti Othman	Veterinary Officer	Department of Veterinary Services, Malaysia
11.	Mongolia	Enkhbold Baasansuren	Chief of Veterinary laboratory	Veterinary hospital in Bulgan province
12.	Myanmar	Myint Mon	Assistant Director	Livestock Breeding and Veterinary Department
13.	Nepal	Bidur Prasad Gautam	Senior Veterinary Officer	Animal Quarantine Office, Morang, Nepal
14.	New Caledonia	De Valicourt Loïse	Head of veterinary services	DAVAR SIVAP
15.	New Zealand	Mark Andrew Neill	Chief Advisor	OSPRI
16.	Papua New Guinea	Ilagi Puana	CVO	NAQIA

17.	Thailand	Reka Kanitpun	Veterinary officer	National Institute of Animal Health
18.	Sri Lanka	Hemal Kothalawala	Department Of Animal Production and Health	Director/Veterinary Research Institute
19.	Vanuatu	Alick Donald Worworbu	Animal health Officer	Department of Livestock Vanuatu
20.	Vietnam	Le Thai Thi Minh	Head of Laboratory	Regional Animal Health No 3, DAH
Experts and Partners				
21.	Japan	Yasuhiko Suzuki	Professor	Hokkaido University
22.	Japan	Kohei Makita	Professor of Veterinary Epidemiology	Rakuno Gakuen University
23.	Thailand	Monaya Ekgatat	Advisor	National Institute of Animal Health, Department of Livestock Development
24.	Thailand	Prapaporn Srilohasin	Mahidol University	Instructor
25.	Belgium	El Hachimi Latifa	Member of the Secretariat	STAR-IDAZ IRC
26.	China	Hai Jiang	Director	China CDC
27.	China	Zhu Liangquan		China Institute of Veterinary Drug Control
Observers				
28.	China	Xiaojie Zhu		China Institute of Veterinary Drug Control
29.	China	Xichao Ou		Reference Laboratory of Tuberculosis, Chinese Center for Disease Control and Prevention
30.	China	Wenlong Nan		China Animal Health and Epidemiology Center
31.	China	Lushi Liu		China Animal Health and Epidemiology Center
32.	China	Jianlong Wang		Inner Mongolia Animal Disease Control Center

33.	China	Yue Zhang		Shandong Province Animal Disease Control Center
34.	China	Lianbin Zou		Guangxi Zhuang Autonomous Region Animal Disease Control Center
35.	China	Youzhi Xie		Hainan Province Animal Disease Control Center
36.	China	Jin Jihui		
Organisers				
37.	China	Mengda Liu		China Animal Health and Epidemiology Center
38.	China	Xiaoxu Fan		China Animal Health and Epidemiology Center
39.	Japan	Kinzang Dukpa	Regional One Health Coordinator	WOAH RRAP
40.	Japan	Peng Li		
41.	Fiji	Elva Borja	Support Consultant - Pacific Sub-region	WOAH RRAP
42.	Thailand	Kinley Choden	Animal Health Officer	WOAH SRR SEA
Support staff from CAHEC				
43.	China	Tianheng Deng		CAHEC
44.	China	Jiwen Li		CAHEC
45.	China	Jia Jun Gao		CAHEC
46.	China	Mingze Chen		CAHEC
47.	China	Zhining Jia		CAHEC
48.	China	Ningjin Sun		CAHEC
49.	China	Lili Tian		CAHEC
50.	China	Haobo Zhang		CAHEC

Annexure 5. Workshop agenda

From	To	Programme	Presenter/Facilitator
Day 1: 24 September 2024			
Registration: 8:30 – 9 AM		CAHEC	
Session 1.1 Opening session			
9:00	9:15	Welcome remarks • CAHEC • WOAH	Dr Yang Lin, CAHEC Director Dr Hirofumi Kugita, WOAH Regional Representative
9:15	9:25	Workshop objectives	Dr Kinzang Dukpa, WOAH RRAP
9:25	9:45	Introduction of the participants	Peng Li, WOAH RRAP
9:45	10:00	Logistics announcement	
10:00	10:30	Group photo and coffee break	
Session 1.2 WOAH Standards and situational analysis of Zoonotic Tuberculosis (zTB)			
10:30	10:50	WOAH Strategies for control of bovine tuberculosis in different contexts	Dr Monal Daptardar, WOAH HQ (recorded)
10:50	11:05	Disease epidemiology and regional situation of bovine TB in the context of zTB	Dr Yasuhiko Suzuki, Hokkaido University
11:05	11:20	A Review of the Implementation of the Roadmap for Zoonotic TB in Selected Countries of Africa, South East Asia and West Pacific Regions	Dr Corinne Merle, WHO Geneva (recorded)
11:20	11:30	Q&A	
Session 1.3 Disease diagnostics, surveillance and control			
11:30	11:45	Alternative Strategies for the Control and Elimination of *Mycobacterium tuberculosis* Complex Infection (MTBC) in Livestock	Dr Francisco Olea-Popelka (recorded)
11:45	12:00	The Situation and Future Prospects of Zoonotic Tuberculosis Prevention and Control	Dr. Xiaoxu Fan, CAHEC
12:00	12:15	Advances in the application of Bacteriological Diagnosis of TB	Dr Xichao Ou, China CDC
12:15	12:30	Q&A	
12:30	13:30	Lunch	
13:30	14:30	Best practices on diagnostics, surveillance and control/elimination efforts in the region	Fiji, Indonesia, Nepal, Sri Lanka
Session 1.4 Member Posters			
14:30	15:30	Member poster gallery walk on zTB	Facilitated by WOAH/CAHEC/experts
15:30	15:45	Tea break	
15:45	17:00	Key findings from the poster session	Facilitated by WOAH/CAHEC/experts

18:00	20:00	Workshop Dinner hosted by WOAH	Sophia International Hotel

From	To	Programme	Presenter/facilitator
Day 2: 25 September 2024			
Session 2.1 WOAH Standards and situational analysis of Brucellosis			
9:00	9:05	Recap of Day 1	A participant
9:05	9:20	WOAH International Standards on Brucellosis	Dr Monal Daptardar, WOAH HQ (recorded)
9:20	9:35	Key features of animal brucellosis – implications on control and elimination	Dr Kohei Makita, Rakuno Gakuen University, WOAH CC
9:35	9:50	Global and regional situation, progress and challenges of Animal Brucellosis	Dr Monaya Ekgatat, WOAH Reference Laboratory for Brucellosis, Thailand
9:50	10:05	Q & A	
Session 2.2 Disease diagnostics, surveillance and control			
10:05	10:20	Diagnosis and control practice of animal brucellosis in China	Dr. Shufang Sun, CAHEC
10:20	10:35	Practice towards Animal Brucellosis Vaccination in China	Dr. Liangquan ZHU, IVDC
10:35	10:50	Tea/coffee break	
10:50	12:00	Best practices on diagnostic, surveillance and control/elimination efforts in the region	Australia, Bangladesh, Thailand
12:00	12:15	Control of human brucellosis in China	Dr. Hai Jiang, CDC, China
12:15	12:30	Q&A	
12:30	13:30	Lunch	
Session 2.2 Country Poster			
13:30	15:30	Country poster gallery walk on Brucellosis	Facilitated by WOAH/CAHEC/experts
15:30	15:45	Tea break	
15:45	17:00	Key findings from the poster session	Facilitated by WOAH/CAHEC/experts

From	To	Programme	Presenter/facilitator
Day 3: 26 September 2024			
Session 3.1 Other initiatives, tools and best practices sharing			
9:00	9:05	Recap of Day 2	A participant
9:05	9:20	WOAH Laboratory Twinning on zTB and benefits for Asia Pacific Region	Dr. Mengda Liu, CAHEC
9:20	9:35	WOAH Laboratory Twinning on Brucellosis and benefits for Asia Pacific Region	Dr Xiaojie Zhu, IVDC

9:35	9:50	STAR-IDAZ IRC and its activities on Bovine TB and brucellosis globally, with a specific focus on the Asia Pacific region.	Latifa Elhachimi, STAR-IDAZ Secretariat
9:50	10:30	Experience sharing from the research institutions/universities/alliances from across AP region and beyond 1. A new scenario of zoonotic tuberculosis in South Asia 2. Rapid TB Diagnosis in Cynomolgus Macaques: Leveraging Xpert MTB/RIF Ultra Assay for Enhanced One Health Outcomes	1. Dr Yasuhiko Suzuki, Hokkaido University 2. Dr Prapaporn Srilohasin, Mahidol University
10:30	10:45	Tea/coffee break	
Session 3.2 Group Work to identify regional priority actions for zTB and brucellosis control			
10:45	11:00	Joint strategy for zTB and brucellosis control in Japan	Yukitake Okamura, MAFF Japan.
11:00	12:30	Group works on different topics such as diagnostics and surveillance, control options, one health coordination	Facilitated by WOAH/CAHEC/experts
12:30	13:30	Lunch	
13:30	15:00	Presentations for the group works	Group facilitators
15:00	15:15	Tea/coffee break	
Session 3.3 Closing Session			
15:15	16:30	Workshop recommendations and evaluation	WOAH
16:30	17:00	Closing remarks	WOAH/CAHEC

- END OF REPORT -