Biosurveillance Research Programme

1st Grant Call Briefing

14 January 2025

- The 1st grant call for the Biosurveillance Research Programme has been launched as of **3 January 2025.**

- We invite interested researchers to submit suitable full proposals for potential funding support under **6 Call Topics:**

  1) Public Health Risk of Leptospirosis and Its Environmental Drivers in Singapore: A One Health Approach
  2) Zoonotic disease spillover risk from domestic dogs and cats in Singapore
  3) Avian influenza transmission risk in domestic and wild birds in Singapore
  4) Endemic zoonotic pathogens in urban birds and implications on public health in Singapore
  5) Ecology of emerging tick vectors and tick-borne pathogen epidemiology in Singapore
  6) Risk and drivers of zoonotic disease transmission from mammalian wildlife in Singapore

Schedule

2:00pm	1. Opening and Overview of Biosurveillance Research Programme **(Dr Chua Tze Hoong)**
2:05pm	2. Grant management admin **(Ms Sabrina Roslan)** • Third Party Risk Management (TPRM) briefing • Grant Call conditions and eligibility criteria • Review process • Instruction for submission of proposals
2:35pm	Q&A (10 min)
2.45pm	3. Grant Call Topics **(Dr Chua Tze Hoong)**
3.00pm	Q&A (15 min)
3:15pm	Refreshment
3:30pm	4. Breakout networking
4:00pm	End of Programme

1. Overview of Biosurveillance Research Programme

*Dr Chua Tze Hoong, Programme Director*

List of Attendees Today

- Agency for Science Technology and Research (A*STAR) e.g.,
    - Genome Institute of Singapore
    - Institute of Materials Research and Engineering (IMRE)
    - Infectious Diseases Lab
- Cellbae Pte Ltd
- Delta Electronics International Pte Ltd
- Mandai Nature
- Nanyang Technological University e.g.,
    - Lee Kong Chian School of Medicine
    - Institute for Digital Molecular Analytics and Science (IDMxS)
    - Singapore Centre for Environmental Life Sciences Engineering
- National University of Singapore e.g.,
    - Duke-NUS Medical School
    - Infectious Diseases Translational Research Programme, Yong Loo Lin School of Medicine
    - Lee Kong Chian Natural History Museum
    - Saw Swee Hock School of Public Health
- National Centre for Infectious Disease (NCID)
- Royal Veterinary College
- Singapore Institute of Technology
- Singapore-MIT Alliance for Research and Technology (SMART)
- Singapore Veterinary Association
- Temasek Life Sciences Laboratory

Biosurveillance is the systematic and continuous gathering, integration, interpretation, and communication of information on emerging diseases, animal hosts and vectors for early warning and detection. Early response policies and measures reduce the magnitude, and cost of emergency response measures subsequently.

The One Health agencies (MOH, NEA, NParks, PUB and SFA) have identified four strategic thrusts under the Whole-of-Government (WOG) Biosurveillance Framework to build up capabilities to proactively monitor disease threats upstream in natural and urban environments
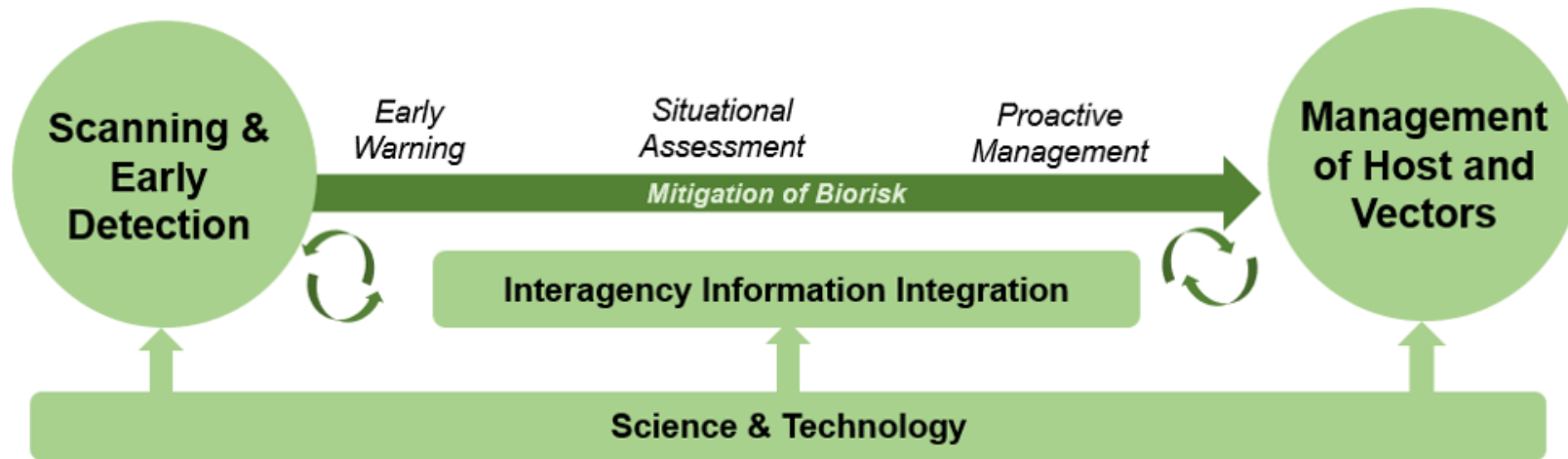
Whole-of-Government (WOG) Biosurveillance Framework

OFFICIAL (OPEN)/NON-SENSITIVE

Biosurveillance Research Programme Research Themes

The biosurveillance research programme seeks to foster **transdisciplinary research collaboration through a One Health framework,** by studying key drivers of zoonoses at the **animal-human-environment interface** in two thematic knowledge areas:

Incursion via animal movement (e.g. unregulated trade, migration)
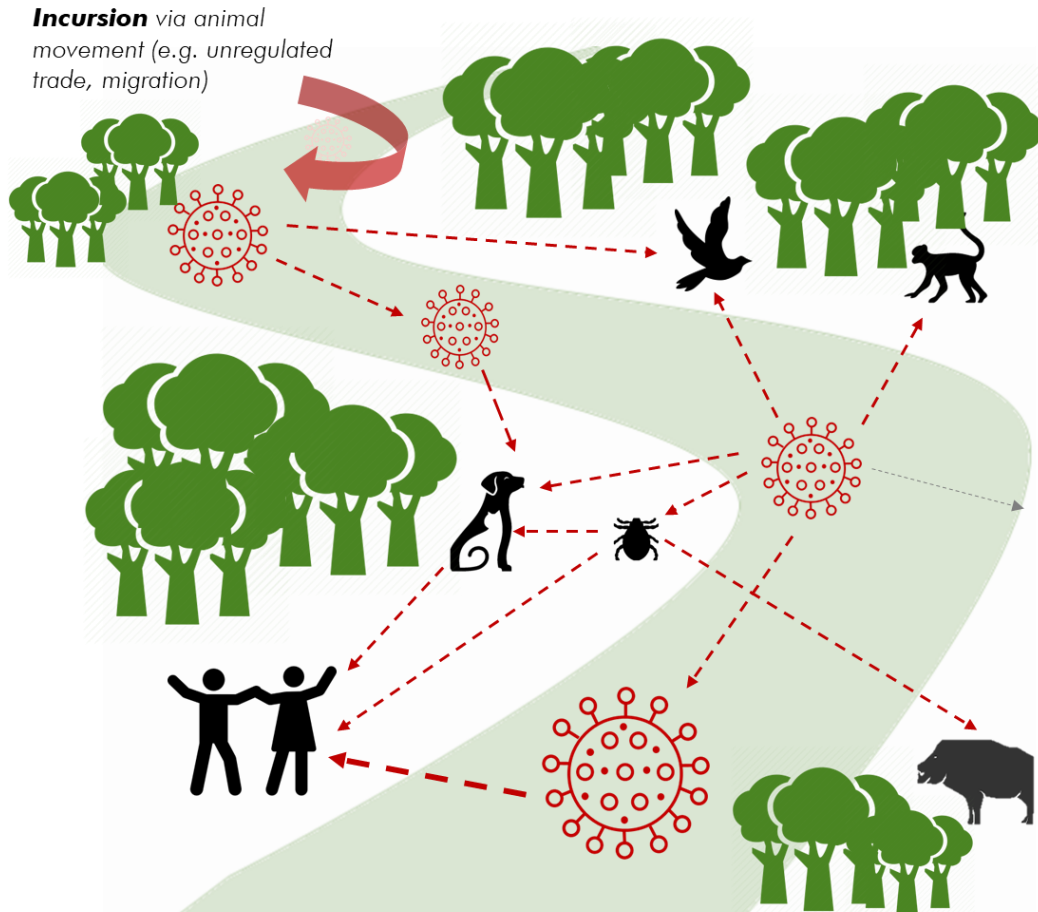
Genomics and Genetics

- Genome as the **critical link among pathogens, hosts and vectors**
- Generate insights into microbiome, genomic & genetic effects on diseases in animal hosts together with enhanced **invertebrate vector (iDNA)** and **environmental sampling (eDNA)** for animal pathogen detection and characterisation

Epidemiological & Ecological Connectivity

- Going beyond pathogen discovery to linking pathogens to the wider urban ecosystem
- Clarify **ecological and epidemiological linkages** between animal hosts, vectors, environment and humans, and **environmental and anthropogenic* influences** on zoonoses

supports

Develop and examine evidence-based **upstream mitigation strategies** for zoonoses

Objectives of Biosurveillance Research Programme

Overall, the research outcomes seek to contribute to building a **healthy, safe, and resilient City in Nature** :

Research outcomes should have **real world practical applications** tailored to **Singapore's context** with **clear public health impact**

Long Term Research Objectives

✓ Build scientific knowledge to establish a more effective system to **monitor and detect** zoonotic diseases within the urban environment

✓ Provide insights on how **urban development and animal movement** may affect zoonotic disease transmission and ecology

✓ Inform **upstream strategies for effective zoonotic disease mitigation**, such as through land-use planning, habitat restoration, and targeted animal management measures

✓ **Empower relevant industry and community stakeholders** with the required scientific knowledge and safe practices for zoonotic diseases prevention

2. Grant Management Admin

Nur Sabrina Roslan, Grant Management Team
Lam Tuck Meng, ACISO

MND Family Third Party Risk Management Programme (TPRM)

Restricted \ Non-Sensitive

Most cyber incidents that affected MND Family in recent years were due to Vendor/Partner Incidents

Problem Statement for TPRM Programme
As Govt systems are reasonably protected, we can expect attackers to target our Third Party vendors/systems, which are less well defended. Further, breaches may not be known and reported.

TPRM is designed to enable agencies to establish adequate oversight over Third Parties:

- Risk assessment at the start of all Projects.
- Certification in Cyber Hygiene and Data Protection.
- Continuous Monitoring of Vendor Performance

TPRM Expectations for Vendors/Research Partners

▶ Infosecurity Hygiene Certifications

  ▶ Cyber Essentials (CTE)

  ▶ Cyber Trust Mark (CTM)

▶ Data Hygiene Certifications

  ▶ Data Protection Essentials (DPE)

  ▶ Data Protection Trust Mark (DPTM)

▶ Demonstrate above hygiene in daily work as advised by certifying companies.

	Cyber Essentials	Cyber Trust Mark				
		Tier 1: Supporter	Tier 2: Practitioner	Tier 3: Promoter	Tier 4: Performer	Tier 5: Advocate
Cyber Governance and Oversight						
1. Governance				•	•	•
2. Policies and procedures				•	•	•
3. Risk management	-	•	•	•	•	•
4. Cyber strategy						•
5. Compliance		•	•	•	•	•
6. Audit					•	•
Cyber Education						
7. Training and awareness*	•	•	•	•	•	•
Information Asset Protection						
8. Asset management*	•	•	•	•	•	•
9. Data protection and privacy*	•	•	•	•	•	•
10. Backups*	•	•	•	•	•	•
11. Bring Your Own Device (BYOD)					•	•
12. System security*	•	•	•	•	•	•
13. Anti-virus/Anti-malware*	•	•	•	•	•	•
14. Secure Software Development Life Cycle (SDLC)						•
Secure Access and Environment						
15. Access control*	•	•	•	•	•	•
16. Cyber threat management					•	•
17. Third-party risk and oversight						•
18. Vulnerability assessment				•	•	•
19. Physical/environmental security			•	•	•	•
20. Network security			•	•	•	•
Cybersecurity Resilience						
21. Incident response*	•	•	•	•	•	•
22. Business continuity/disaster recovery			•	•	•	•
	8 DOMAINS	**10 DOMAINS**	**13 DOMAINS**	**16 DOMAINS**	**19 DOMAINS**	**22 DOMAINS**

DPE

1: Register your DPO with ACRA/PDPC
2: Take inventory of your organisation's personal/biz critical data, hardware and software, accounts
3: Establish your organisation's data protection and security governance policies
4: Develop an incident response and data breach management plan
5: Complete Data Protection and Cybersecurity training set out for employees
6: Implement Data Protection and Cybersecurity measures

DPTM

Principle 1: Governance and Transparency
A: Establish data protection policies and practices
B: Establish queries, complaints and dispute resolution handling processes
C: Establish processes to identify, assess and address data protection
D: Establish a data breach management plan
E: Accountability
F: Internal Communication and Training
Principle 2: Management of Personal Data
A: Appropriate Purpose
B: Appropriate Consent
C: Appropriate Use and Disclosure
D: Compliant Overseas Transfer
Principle 3: Care of Personal Data
A: Appropriate Protection
B: Appropriate Retention and Disposal
C: Accurate and Complete Records
Principle 4: Individual's Rights
A: Effect Withdrawal of Consent
B: Provide Access and Correction Rights

How to Get Certified

▶ Cyber Hygiene Certification (from CSA)

  ▶ https://www.csa.gov.sg/our-programmes/support-for-enterprises/sg-cyber-safe-programme/cybersecurity-certification-scheme-for-organisation

▶ Data Hygiene Certification (from IMDA)

  ▶ https://www.imda.gov.sg/how-we-can-help/data-protection-essentials

  ▶ https://www.imda.gov.sg/how-we-can-help/data-protection-trustmark-certification/

▶ Your company may be eligible for grants/subsidies for the 2 certification. Please contact CSA and IMDA for more details.

Grant Call Eligibility & Funding Criteria

Grant Call Eligibility

- All Singapore-based public research institutes (RIs) (e.g., Institutions of Higher Learning (IHLs) and A*STAR RIs), companies, company-affiliated research laboratories or institutions and not-for-profit entities are eligible to participate in the call.

- The Lead PI who leads the Research must be based in Singapore. Collaboration with Singapore-based and foreign organisations and experts, in the capacity of Co-Investigator (Co-I) or as Collaborator, is allowed.

- All funding awarded must be used to carry out the research work in Singapore, unless expressly approved by the grantor.

- Grant applicants are strongly encouraged to collaborate with industry partners to develop innovative solutions that can address the call objectives and demonstrate strong potential for real-world application within and beyond Singapore.

- R&D proposals already funded by other government agencies will not be considered. R&D proposals with similar scope, which are currently under evaluation by other funding initiatives, will not be considered until the results from the other funding initiatives are finalised. Lead PIs, Co-Is, and Collaborators will need to declare other funding sources as well as participation in other funding initiatives during application.

Additional notes for private sector entities

- Funding for private sector entities would be conditional on collaboration with a public research performer for:
    - Research projects with a total project budget more than S$500,000;
    - Test-bedding/demonstration/scale-up projects with a total project budget more than S$2.0mil.

- For projects funding non-Singaporean entities (i.e., companies registered in Singapore with less than 30% local shareholding, determined by the ultimate individual ownership), a Singapore Technology Licensing Office (STLO) must be appointed regardless of the involvement of public research performer.

Funding Criteria

Direct Costs*

- Supportable direct costs are incremental cost required to execute the programme; can be classified into the following cost categories:-
    - Expenditure on manpower (EOM);
    - Equipment;
    - Other Operating Expenses (OOE); and
    - Overseas Travel

Indirect Costs (i.e. "overheads")

- Costs that are incurred for common or joint objectives and therefore cannot be identified readily and specifically with a particular sponsored research project, but;
- Contribute to the ability of the Institutions to support such research projects (e.g., providing research space, research administration and utilities), and not through the actual performance of activities under the sponsored projects.

* Please refer to the Annex C of the Grant Call info sheet for the list of non-fundable direct costs of research.
** According to National Supercomputing Centre (NSCC) Singapore policies, research projects will be charged for access to NSCC's High Performance Computing (HPC) resources. Applicants are required to budget for their compute requirements and associated costs in grant applications, where necessary.

Funding Criteria

Singapore-based IHLs/public research institutes	- Lead PI or Co-I will qualify for: **[Direct costs] 100%** of the approved qualifying direct costs of a project; **[Indirect costs] 30%** of the total qualifying approved direct costs of a project.
Singapore-based private sector entities (incl. not-for-profit organisations)	- Lead PI or Co-I will qualify for: **[Direct costs] Up to 50%** of the approved qualifying direct costs of a project 30% for all non-Singaporean entities (incl. non-Singaporean not-for-profits) and Singapore Large Local Enterprises (LLEs); 50% for Singapore Small Medium Enterprises (SMEs) and start-ups; - Singapore not-for-profits will be treated based on their size (i.e., will qualify for up to 50%, if they meet the SME definition).
Overseas organisations	<u>**Not**</u> permitted to receive, directly or indirectly, any part of the funding, whether in cash or in the form of assets acquired using the funding or otherwise unless expressly approved by the grantor. - Exception: **Travel expenses** for Visiting Professors/Experts (e.g., overseas-based Co-Is and Collaborators) **to come over to Singapore,** which should be identified and budgeted for upfront in the Other Operating Expenses vote to be incurred by the Host Institution.

Funding Criteria

Additional notes on Collaborators

- Collaborators are **not** permitted to receive, directly or indirectly, any part of the funding, whether in cash or in the form of assets acquired using the funding or otherwise unless expressly approved by the grantor.

Additional notes on funded assets

- All assets acquired using the funding must be located in Singapore and maintained within the control of the grantees.

Please refer to the Grant Call info sheet for detailed information on the guidelines for the grant call.

Review Process

Review Process – at a glance

Preliminary Compliance/Eligibility Check

Project Evaluation (Multi-stage)

Final Compliance/Eligibility Check

Project Award

Evaluation of Proposals

Evaluation of proposals will include:

1. Technical Peer Review

Proposals will be subject to a round of technical peer review by domain experts* with relevant expertise, to ensure excellent science in proposals.

2. Project Evaluation Panel

Shortlisted applicants will be invited to present their proposals to a Project Evaluation Panel, consisting of relevant agency representatives, the Programme Director, and other external experts (where relevant).

Successful applicants will be informed by the Biosurveillance Research Programme Office on the award of the grant. The Programme Office's decision on project and funding support will be final.

Research teams applying for the grant call are invited to recommend potential suitable peer reviewers for the Biosurveillance Research Programe Office's consideration, as part of the proposal submission process. The final decision on the peer reviewers will be decided by the Evaluation Committee.

Evaluation Criteria

Criteria

Potential Contribution to Biosurveillance Research Objectives
- Relevance of proposed research in contributing to objectives/targets stated for the Biosurveillance Research Call Topic.

Potential for Breakthrough and Innovation
- Quality and significance of proposed research, including value for money, potential for breakthrough/innovation to advance knowledge and understanding within its own field or across different fields, and proposed application of research outcomes (pathway to impact).

Execution Strength and Technical Competency of Research Team
- Quality of plans for execution and delivery of the research programme and goals, including the appropriateness of the proposed milestones and deliverables (specific to evaluation of full proposal applications)
- Quality, significance, and relevance of the recent research record of the Lead PI and Co-Is and the strength of the applicant group, including likely synergy in delivering research and potential for international leadership.

Instructions for Submissions of Proposals

Overview of Timeline

FOR APPLICANTS & INTERESTED PARTIES (SGT, UTC +08:00)

Grant Call Opens (for 12 weeks)	3 January 2025, 2.00pm
Physical Briefing & Networking Session for Biosurveillance Research 1st Grant Call	14 January 2025, 2.00pm
Grant Call Closes (Proposal Submission Deadline)	28 March 2025, 2.00pm

FOR SHORTLISTED APPLICANTS ONLY

Notification of shortlisted applicants	Q2 2025*
Presentation to Project Evaluation Panel (2 or 3 days)	Q2-Q3 2025*

FOR SUCCESSFUL AWARDEEES ONLY

Approval and Letter of Award	Q4 2025 onwards*

* Timings are indicative; shortlisted/successful applicants will be notified accordingly.

Grant Call Details

Grant call information and relevant documents at:
- [Biosurveillance Research 1st Grant Call website](#)
- [IGMS](#)

Application <u>only</u> through IGMS:
- See section on "Application Guidelines". All funded proposals should follow the prevailing Research Grant Terms and Conditions and NR Fund Guide.

- The application will only be considered valid if the submission of the full proposal is completed in IGMS, including endorsement by the Director of Research (also in IGMS) by the proposal submission deadline **(28 March 2025, 2.00pm).**
    - A copy of the application should also be sent via email to the Biosurveillance Research Programme Office (Biosurveillance_Research@nparks.gov.sg) after this.

- E-mail or walk-in applications will not be accepted.

- Late submissions will not be considered. Incomplete submissions may also be rejected. Applicants are advised not to submit their application at the last minute in case of technical errors with the IGMS website.

- The following slides outline steps for "Using IGMS" and "Full Proposal Submission".

Application Guidelines

Please choose one of the options below. It will direct you to the login type based on your choice.

Host Institution Users
- Principal Investigator
- HI Administrator
- Office of Research/ Director of Research
- HI Finance/ HI Human Resource
- Data Administrator/ HI Audit

Individual Users
- Singapore-based Applicants
- Overseas-based Applicants
  Eg. NRF Fellowship Applicants

Reviewers
- Singapore-based Reviewers
- Overseas-based Reviewers

Using IGMS:

Key details for first time users

- Under the landing page, select the **"Host Institution Users"** option. This option will lead you to "Login with Singpass (Logging in as Business User)". Login or register using your Singpass.
- **Authorise ORCID ID** before any grant application.
- Fill up mandatory fields.
- Update user profile.

Application Guidelines

Full Proposal Submission:

- Login to the system using the "Host Institution Users" option and subsequently, via "Login with Singpass (Logging in as Business User").
- Click on grant call topic of interest under "Open Opportunities" and click "Apply".

For detailed steps, please refer to:

- [Quick guide for Potential Applicants](#); and
- [Help guide for Potential Applicants](#)

(also available on the IGMS "Training Guides" page:
https://www.researchgrant.gov.sg/Pages/TrainingGuides.aspx)

Contact Information

- For **general information,** please refer to the Grant Call FAQs document in either:
  - [Biosurveillance Research 1st Grant Call website](#)
  - Under "Related Documents" under the grant call topic of interest on [IGMS](#)

- For transparency, no verbal enquiries will be entertained. However, if you require clarification, please email the Biosurveillance Research Programme Office at Biosurveillance_Research@nparks.gov.sg. Answers to all received queries will also be reflected in the Grant Call FAQs document (see above), which will be updated periodically to ensure that all applicants have equal access to additional information.

- For any queries on the **use of IGMS**, please contact the IGMS helpdesk.
  Tel No: (65) 6556 8807 or (65) 6556 6971
  E-mail: helpdesk@researchgrant.gov.sg

3. Grant Call Topics

Dr Chua Tze Hoong, Programme Director

Overview of Grant Call Topics

Each grant call has estimated duration of **3 years** and budget of **$2.4mil**
- *Each grant call will be evaluated and awarded separately*

Researchers are strongly encouraged to **collaborate** to craft **holistic and multidisciplinary proposals** to address the cross-cutting research objectives

S/N	Grant Call Topic
1	Public Health Risk of Leptospirosis and Its Environmental Drivers in Singapore: A One Health Approach
2	Zoonotic disease spillover risk from domestic dogs and cats in Singapore
3	Avian influenza transmission risk in domestic and wild birds in Singapore
4	Endemic zoonotic pathogens in urban birds and implications on public health in Singapore
5	Ecology of emerging tick vectors and epidemiology of zoonotic tick-borne pathogens in Singapore
6	The risk and drivers of zoonotic disease transmission from mammalian wildlife in Singapore

Disease Epidemiology
(incorporating non-invasive sampling where possible)

Host and Vector Ecology

Socio-Behavioural Influences

Modelling for Solutions
(incorporating artificial intelligence where possible)

Research Objectives

1. In companion animals and humans, characterise:
   a) **common strains** of Leptospira (e.g., seroprevalence
   b) **vaccination coverage**
   c) **risk factors** for exposure and infection.

2. Determine the spatiotemporal distribution and ecology of different strains of Leptospira in
   a) **free-roaming reservoirs** (rats and wild mammals such as shrews and mice),
   b) **environmental reservoirs** (soil and water bodies such as surface waters)
   and their association with environmental factors (e.g., water parameters, landscape features that predispose to flooding). This should cover the key land use types (e.g., built-up areas, green spaces, and their interface).

3. Study the impact of **weather pattern changes** (e.g., increase in temperature and precipitation changes) and **land use changes** **(e.g., urbanisation)** on the habitats and population dynamics of urban rats and other potential animal reservoirs for leptospirosis, and to understand how these changes may potentially alter environmental maintenance and transmission of leptospirosis.

Projects are also encouraged to further build upon the above-mentioned objectives, and/or propose additional research objectives. While the projects must focus on leptospirosis, they may also study additional rodent-borne zoonoses..

Research Objectives

1. Determine the **epidemiology (e.g., prevalence, risk factors) of rabies (e.g., vaccination coverage) and other zoonotic pathogens** in domestic dogs and cats in different settings (e.g., imports, free-roaming, multi-establishments, homes).

2. Characterise the **socioeconomic and behavioural drivers** influencing:
   i. Demographics, interaction patterns and transmission pathways in domestic dogs and cats (e.g., owner choices on pet travel and rehoming), including the interface between dogs, cats and humans.
   ii. Biosurveillance efforts (e.g., reporting) for notifiable and emerging diseases and responsible behaviour including preventive measures for zoonotic pathogens by animal owners, general public, and veterinary personnel.

3. Considering domestic dog and cat interaction patterns, transmission pathways and potential intervention measures, characterise and model the **incursion and transmission risk for rabies and other zoonotic pathogens** in domestic dogs and cats.

Projects are also encouraged to further build upon the above-mentioned objectives, and/or propose additional research objectives.

Research Objectives

1. Characterise the **prevalence of AIV** among key wild migratory and local bird species to inform surveillance efforts, map incursion risk areas and identify high-risk populations.

2. Investigate **population and movement ecology** (e.g., abundance, distribution, and activity/migration) for key wild migratory and local bird species for the purpose of identifying habitat associations, modelling incursion risk maps and transmission network across the migratory flyway and Singapore.

3. Develop simulation model to investigate **transmission dynamics** (e.g. incursion risk and local spread) to the avian communities in Singapore. Specifically on the risk of avian influenza **introduction** by wild migratory birds to Singapore and local **transmission** at the wild-domestic bird interface (including poultry, ornamental and passerine birds) in Singapore.

Projects are also encouraged to further build upon the above-mentioned objectives, and/or propose additional research objectives.

Research Objectives

1. Determine the **diversity and prevalence of zoonotic pathogens** found in urban birds in Singapore.

2. Understand and **model the transmission risk and pathways** of zoonotic pathogens from urban birds to humans incorporating various epidemiological understanding of urban avian-environment-human interactions, pathogen characteristics (i.e. survivability), and epidemiological contact (e.g. proximity to food establishments).

3. Correlate the **environmental and host factors** that may influence the occurrence and viability of these pathogens and **identify their sources** (host) using molecular methods (i.e. microbial source tracking or metabarcoding).

Projects are also encouraged to further build upon the above-mentioned objectives, and/or propose additional research objectives.

Research Objectives

1. Identify and **characterise ticks** from the environment and associated animal hosts in Singapore and determine the **population structure** (e.g., diversity, distribution) of ticks from the environment (e.g., land-use, microclimate) and reservoir hosts in Singapore.

2. Identify and characterise **zoonotic pathogens* from ticks** and determine the sociobehavioural and spatio-temporal factors that drive the prevalence and risk factors of these zoonotic pathogens*.

3. Model **transmission dynamics** of tick-borne pathogens in Singapore to inform risk assessments and mitigative strategies.

* Mainly *Ehrlichia* spp., *Anaplasma* spp., *Borrelia* spp., and *Rickettsia* spp.

Projects are also encouraged to further build upon the above-mentioned objectives, and/or propose additional research objectives.

Research Objectives

1. To establish the **prevalence of emerging and re-emerging zoonotic diseases** (e.g., malaria, henipavirus) from native synanthropic mammalian wildlife species (e.g., squirrels, otters, bats, macaques and civets) through advanced sampling and omics-based techniques.

2. To identify the **disease reservoir potential, transmission dynamics and risks** considering the ecological factors of the studied native synanthropic mammalian wildlife.

3. To examine the **impacts of environmental and anthropogenic factors** on disease transmission dynamics in Singapore.

4. To identify the **socio-demographic factors** that influence disease transmission dynamics within the human-wildlife interface.

Projects are also encouraged to further build upon the above-mentioned objectives, and/or propose additional research objectives.

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