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Message from the CEO



Dr. Mithun TK
Founder & CEO, Project One Health

It is with great pleasure and pride that I present this compendium, a curated compilation of abstracts reflecting the diverse scientific contributions and innovative ideas shared by participants of the International Conference on One Health 2026 hosted on the Ist of November 2026 at Punnamda, Alappuzaha, Kerala, India. This compendium stands as a repository of knowledge, most current research, cutting edge practices and valuable insights that will drive the progress of the One Health concept to a new height. Each abstract in this volume represents a novel contribution toward fostering interdisciplinary partnerships and advancing our collective mission to safeguard the health of all living beings and the ecosystems we share. I want to extend my sincere appreciation to all the researchers, scholars, and academicians who have contributed their time and expertise to this endeavor. As we begin this journey together, let us carry forward the spirit of curiosity, collaboration, and commitment to a healthier, more harmonious world.

Warm regards,
Dr. Mithun TK

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Theme 1: Zoonotic Diseases, Emerging Pathogens & Spillover Surveillance
Focuses on diseases transmitted between animals and humans, vector-borne threats, wildlife-livestock-human interfaces, and early-warning outbreak systems.

Theme 2: Antimicrobial Resistance (AMR) & Antibiotic Stewardship across the Human-Animal-Environment Interface
Focuses on multi-drug resistance, antibiotic usage in livestock and human clinical settings, environmental dissemination, and wastewater/leachate surveillance.

Theme 3: Environmental Health, Climate Change, Food Safety & Ecosystems
Covers environmental pollution, climate change impacts on health, water-sanitation-hygiene (WASH), food safety, and animal agriculture management.

Theme 4: Integrating AYUSH & Traditional Systems into One Health & Therapeutics
Focuses on traditional medicine (Ayurveda, Yoga & Naturopathy, Unani, Siddha, Homeopathy), botanical extracts, ethnoveterinary medicine, and natural product therapeutics

Theme 5: Occupational Health, Workplace Hazards, and Burnout Among Professionals
Focuses on physical and psychological stressors, injuries, and burnout experienced by healthcare providers, agricultural workers, radiographers, and other working professionals.

Theme 6: Mental Health, Psychosocial Well-Being, and Behavioral Studies
Focuses on community mental health, stress, coping mechanisms, loneliness, and psychological resilience across various populations (children, youth, elderly, and patients

Theme 7: Maternal, Child, and Reproductive Health & Community Nutrition
Focuses on child development, maternal psychological distress, undernutrition, domestic violence, and public health screening programs for women.

Theme 8: Chronic Diseases, Public Health Vulnerabilities, and Clinical Epidemiology
Focuses on population-level disease burdens, non-communicable diseases (NCDs), treatment adherence, environmental-health intersections, and specialized clinical trials.

Theme 9: Digital Health, AI, Modeling & Health Systems Strengthening
Focuses on technology-enabled frameworks, artificial intelligence in healthcare/surveillance, digital public infrastructure, innovative alternative therapies and policy frameworks

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PROJECT One Health™

Theme 1:

Zoonotic Diseases, Emerging Pathogens & Spillover Surveillance

ICOH 001

Seroprevalence and Risk Factors of Human Brucellosis in a Peri-Urban Setting of Odisha, India

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Brucellosis is one of the most neglected age-old bacterial zoonotic diseases caused by *Brucella sp*. It remains a public health concern due to underdiagnosis and non-specific clinical presentation. This study was conducted to determine the seroprevalence and associated risk factors of human brucellosis in a peri-urban setting of Khordha district, Odisha, India. The study participants (n=623) were selected using the Kish-Grid method. We collected approximately 5 mL of venous blood aseptically and separated serum for serological investigation. The demographic and risk-related details were collected through a structured questionnaire. For the detection of Brucella-specific antibodies, three serological tests were performed. Seropositivity by the Rose Bengal Plate Test (RBPT) was 3.69%, the Standard Agglutination Test (SAT) was 0.16% and the IgM Enzyme-linked immunosorbent assay (IgM-ELISA) was 9.79 %. Livestock-owning households, milking practices, and animal abortion history in the household emerged as significant risk factors associated with Brucella exposure. Awareness of the disease was critically low, with 3.21% of the participants having heard of the disease. The findings emphasise the importance of a One Health approach and the need to adopt safer animal-handling practices, along with raising awareness of brucellosis among communities with livestock contact. A One Health framework integrating community awareness, veterinary control measures, and public health surveillance can substantially reduce disease transmission.

Keywords: Seroprevalence, Risk factors, Human Brucellosis

ICOH 002

Artificial intelligence - Enabled one Health Surveillance: Strengthening Early Detection and Outbreak Response in Srinagar

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Background: Emerging infectious diseases arise from complex interactions between humans, animals and the environment. Conventional surveillance systems may function through separate sectoral platforms, resulting in fragmented information and delays in detecting emerging threats. Srinagar, with its urban population and diverse human–animal–

environment interfaces, provides an important setting for strengthening integrated One Health surveillance. Artificial intelligence (AI) offers opportunities to improve early warning, risk assessment and outbreak response.

Objective: To explore the potential role of AI-enabled integrated surveillance in strengthening early detection and response to emerging infectious diseases in Srinagar through a One Health approach.

Methods: A narrative review was undertaken using recent scientific literature, World Health Organization guidance and relevant Indian One Health policy documents. Evidence was synthesized regarding applications of AI in disease surveillance, outbreak prediction, environmental monitoring, laboratory data integration and public-health decision-making. Potential applications and implementation challenges relevant to Srinagar were examined.

Results: AI can facilitate integration of information from human health, veterinary, wildlife and environmental sources. Machine learning, natural-language processing, geospatial analytics and digital early-warning systems can help identify abnormal disease patterns and potential outbreak signals. In Srinagar, integration of clinical and laboratory surveillance with animal-health information, vector surveillance, environmental and meteorological data, and wastewater surveillance could strengthen early identification of emerging threats. However, data fragmentation, interoperability, data quality, privacy concerns, algorithmic bias, limited technical capacity and the need for epidemiological validation remain important challenges.

Conclusion: AI-enabled One Health surveillance has the potential to strengthen preparedness for emerging infectious diseases in Srinagar. Interoperable surveillance platforms, cross-sectoral data sharing, local capacity building, ethical governance and human oversight should be prioritized. AI should complement, rather than replace, conventional epidemiological surveillance, laboratory confirmation and field investigation.

Keywords: Artificial intelligence; One Health

ICOH 003

Seroprevalence and determinants of zoonotic infections in a peri-urban population in eastern India: findings from a One Health cohort study

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Background: Peri-urban communities at the human–animal–environment interface are vulnerable to zoonotic infections. Therefore, this study aimed to assess the seroprevalence,

identify associated risk factors, and delineate its transmission dynamics in a peri-urban cohort in Odisha, India.

Methods: A baseline assessment of a three-year prospective cohort was conducted among 1,252 participants from six peri-urban villages in Khordha district, Odisha. Sociodemographic, livestock-related, and environmental exposures were collected using a structured questionnaire. Serum samples were tested for IgG and IgM antibodies against brucellosis, leptospirosis, and scrub typhus. Univariable and multivariable logistic regression were used to identify factors associated with IgG seropositivity.

Findings: IgG seroprevalence was 22.4% for brucellosis, 20.7% for leptospirosis, and 80.8% for scrub typhus. Livestock ownership was associated with higher seropositivity for brucellosis and leptospirosis. Independent determinants included agricultural occupation (AOR 1.94), greater cattle exposure, unpasteurised milk consumption (1.97), and livestock abortion history for brucellosis; high cattle exposure (3.57) and household rodents for leptospirosis (7.35); and age, occupation, marital status, and kitchen gardens for scrub typhus. Only 10.2% of participants had heard of these infections.

Conclusion: The substantial burden of zoonotic exposure alongside limited awareness highlights the need for integrated One Health surveillance and targeted prevention strategies in peri-urban communities.

Keywords: Brucellosis, Leptospirosis, Scrub typhus, Seroprevalence, One Health

ICOH 004

Anthrax in Koraput, India: A 15 year retrospective analysis of epidemiological trends, seasonal patterns and vaccine coverage

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Due to its potential use as a bioterrorism agent, anthrax remains a disease of global public health concern, particularly in endemic regions. In India, anthrax is enzootic, especially in the eastern and southern states. Periodic outbreaks in both animals and humans have been reported from tribal and rural areas with poor infrastructure, where livestock rearing practices and socio-cultural traditions contribute to disease transmission. In this study, we analyzed anthrax outbreaks in Koraput district over last about one and a half decades and identified key epidemiological patterns and the vaccine coverage to guide future prevention and control measures. Anthrax in Koraput shows a recurrent seasonal pattern linked to environmental spore viability and intensified human–animal contact. The study highlighted that a sustained,

high-coverage livestock vaccination implemented through an integrated One Health framework with community engagement and inter-sectoral coordination is critical to interrupt transmission and protect vulnerable tribal and rural populations.

Keywords: Anthrax, Outbreak, tribal trends, Vaccination

ICOH 005

A One Health Approach to Leptospirosis: Seroprevalence, risk factors and animal exposure in the Peri-Urban Community of Eastern India

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Background: Leptospirosis is a neglected tropical zoonotic disease with significant public health implications, particularly in low- and middle-income countries (LMICs). Globally, an estimated 1.03 million infections and nearly 58,900 deaths occur annually. However, its true burden remains underestimated due to non-specific clinical manifestations, underreporting, and diagnostic challenges. Leptospirosis commonly presents as an undifferentiated febrile illness and may be misdiagnosed as other acute febrile illnesses (AFIs). It is caused by the spirochete Leptospira, and can present from a mild fever to severe complications affecting multiple organs.

Objectives: The objectives of this study are to estimate the seroprevalence of Leptospira infection among humans, to identify the risk factors associated with Leptospira infection and to assess Leptospira infection among animals and explore their potential role in zoonotic transmission.

Methodology: A community-based cross-sectional study was conducted among 451 adult participants in Kakarudrapur village, Khordha district, Odisha. Data were collected using a structured questionnaire covering demographic characteristics, exposure history, and potential risk factors for leptospirosis. Human serum samples were tested for anti-Leptospira IgG and IgM antibodies using ELISA. Additionally, 136 animal samples were collected from the study area and screened for Leptospira antibodies. Data were analysed using Stata version 17 using logistic regression was performed to identify factors associated with human seropositivity.

Results: Among the 451 human participants, 33.3% (n=150) were positive for anti-Leptospira IgG antibodies, while 15.3% (n=69) were positive for IgM antibodies. Seropositivity was slightly

higher among participants from livestock-owning households and lower among those living in pucca/semi-pucca houses. Among the 136 animal samples tested, 11.0% (15/136) were positive for Leptospira antibodies. Notably, 99.6% of participants had limited or no knowledge regarding leptospirosis.

Conclusion: The findings indicate substantial exposure to Leptospira among the population and evidence of infection or exposure among animals in the study area. The observed knowledge gap highlights the need for strengthened community awareness, preventive practices, and a One Health approach integrating human, animal, and environmental surveillance for leptospirosis control.

Keywords: Zoonotic Disease, Leptospirosis, Seroprevalence, Risk Factors, One Health

ICOH 006

Continued Influenza Surveillance as an Early Warning Tool: Insights from Two Years of Laboratory Surveillance in Coastal Karnataka, India

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Background: Influenza surveillance is an important component of infectious disease preparedness, providing insights into changes in viral activity, seasonal patterns and circulating influenza types and subtypes. We analysed two years of laboratory surveillance data from the coastal Karnataka region of India to describe influenza activity and explore its relevance to an integrated One Health surveillance approach.

Methods: Laboratory surveillance data from October 2024 to September 2026 were retrospectively analysed. A total of 4,345 throat/nasal swabs were collected, along with the demographic, and clinical history of the patients suffering from SARI/ILI. The samples were tested for influenza viruses A(H1N1) pdm09 and influenza A(H3N2) and influenza B using Polymerase Chain Reaction (PCR). Monthly positivity, surveillance-year trends, and age- and sex-specific patterns were assessed. Data-quality checks were also performed to identify missing and discordant subtype results.

Results: Of the 4,345 specimens tested, 1,038 (23.89%) were positive for influenza A and/or B. Influenza A was detected in 832 (19.15%) specimens and influenza B in 206 (4.74%), with one specimen showing co-detection of influenza A and B. Overall influenza positivity increased from 16.5% during October 2024–September 2025 to 30.7% during October 2025–September 2026. Distinct seasonal peaks were observed, with high influenza A activity during July–September 2025 and May–September 2026. The highest monthly positivity was observed in August 2026 (45.8%). Among influenza A-positive specimens with interpretable subtype

results, 558 were A(H1N1) and 274 were A(H3N2). Among influenza A-positive specimens, most were characterized as A(H1N1) or A(H3N2); however, one influenza A-positive specimen could not be identified as either A(H1N1) or A(H3N2) using the available subtype testing. Although this finding alone does not establish the presence of a novel or zoonotic influenza virus, it highlights the importance of maintaining surveillance and ensuring that unusual or uncharacterized influenza-positive specimens are subjected to further investigation, including expanded molecular characterization and genomic sequencing where appropriate.

Conclusion: The surveillance data demonstrates substantial influenza activity with pronounced seasonal variation and changes in the distribution of influenza A subtypes over the two-year period. Our findings demonstrate the value of continuous laboratory-based influenza surveillance in identifying changes in viral activity and detecting infections that may require additional characterization. The identification of an influenza A-positive specimen that could not be assigned to the routinely tested H1N1 or H3N2 subtypes reinforces the need for sustained surveillance, appropriate referral pathways and genomic characterization capacity. From a One Health perspective, integrating human influenza surveillance with animal influenza surveillance, wildlife monitoring, environmental surveillance and genomic data can strengthen early warning systems for emerging and potentially zoonotic influenza viruses.

Keywords: Influenza, Surveillance, One Health, Pandemic Preparedness

ICOH 007

Spatial heterogeneity of human rabies exposure and preparedness across India: a GIS-based one health analysis

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Rabies remains a major One Health challenge in India, with domestic dogs representing the principal source of human exposure. Although data on dog-bite burden, rabies mortality and public-health infrastructure are generated through different systems, their spatial integration remains limited. This study aimed to assess the geographical heterogeneity of rabies exposure and human-health preparedness across India using a GIS-based One Health approach. A state-level database covering 28 States and 8 Union Territories was developed using reported dog-bite cases (2018–2025), human rabies deaths (2022–2024), projected population, estimated stray-dog population, Model Anti-Rabies Clinics and Human Rabies Diagnostic Laboratories. Dog-bite incidence was standardized per 100,000 population. Composite exposure and preparedness indices were developed from selected epidemiological and health-system indicators and visualized using GIS to identify

geographical disparities and potential priority areas. Substantial spatial variation was observed in both rabies exposure and preparedness. Exposure Risk scores ranged from 0 to 0.654, with the highest scores observed in Maharashtra (0.654), Uttar Pradesh (0.493) and Karnataka (0.374). Preparedness scores ranged from 0 to 0.849, with Karnataka (0.849), Kerala (0.704) and Andhra Pradesh (0.667) showing the highest preparedness. Importantly, higher exposure was not consistently accompanied by higher preparedness, indicating geographical mismatches between disease burden and health-system capacity. GIS-based integration of rabies exposure and human-health preparedness indicators can provide spatially interpretable intelligence for identifying priority areas for surveillance, prevention and resource allocation. This focused One Health framework demonstrates the potential of integrating fragmented surveillance data to strengthen evidence-based rabies control strategies in India.

Keywords: rabies, One health, disease surveillance, GIS

ICOH 008

One Health surveillance of spotted fever group Rickettsia at the tick–animal–human interface in the Western Ghats, Kerala, India

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Spotted fever group Rickettsia (SFGR) are neglected zoonotic pathogens maintained at the wildlife–domestic animal–tick–human interface. The Western Ghats of India support diverse tick fauna and intense human–animal–environment interactions, yet the spatial distribution of SFGR and its relevance to human and animal health remain poorly characterized. We investigated the occurrence, molecular diversity and spatial distribution of SFGR in ticks from Kerala and contextualized the findings within a One Health framework. Ticks collected from 31 sites from nine districts of Kerala were morphologically identified, enumerated and processed as pools. Pan-Rickettsia real-time PCR-positive pools were further characterized using gltA, ompA, 17-kDa, ompB and sca4 targets, followed by sequencing, BLAST comparison and maximum-likelihood phylogenetic analysis. Minimum infection rate (MIR) and Bayesian estimated pooled prevalence (EPP) were calculated. Published records of human SFGR, animal-associated SFGR and tick-associated SFGR were integrated geographically to identify areas of convergent One Health risk. Among 777 ticks collected, 26 pools were Pan-Rickettsia positive, with nine pools positive for all five molecular targets. The reconstructed minimum pool denominator was 129, yielding an overall MIR of 3.35% and EPP of 1.53% (95% CrI 1.01–2.16%). Multi-locus analysis identified six principal Rickettsia lineages, including *R. massiliae, R. tamurae, Candidatus R. jingxinensis-like,*

Candidatus R. rara/R. montanensis-like, R. raoultii-like and R. massiliae/R. rhipicephali-like groups. The detection of both recognized and provisionally characterized SFGR in ticks in landscapes with human and animal exposure highlights potential pathogen circulation across interconnected ecological compartments. This study demonstrates substantial molecular diversity of SFGR in Kerala ticks and supports an integrated One Health surveillance approach linking vector, animal, human and environmental interfaces. Combining entomological surveillance with clinical and veterinary reporting could strengthen early detection, risk mapping and targeted prevention of emerging tick-borne rickettsioses in the Western Ghats.

Keywords: One Health; spotted fever group Rickettsia; ticks; zoonoses; Western Ghats; surveillance

ICOH 009

Operationalizing One Health: A Pilot Framework for Bidirectional Surveillance of Brucellosis and Leptospirosis in Krishna District, Andhra Pradesh

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Neglected zoonotic diseases (NZDs), such as brucellosis and leptospirosis, impose a severe, dual burden on public health and agricultural economies worldwide. Traditional vertical interventions routinely fail because they operate within institutional silos, overlooking the complex interactions connecting humans, animals, and shared ecosystems. This abstract outlines a pilot project for coordinated zoonotic disease screening under a unified One Health framework in Krishna District, Andhra Pradesh. The initiative establishes a formalized, cross-sectoral framework implemented by the state's Health Department and the Animal Husbandry Department, with critical implementation support from Jhpiego India and the Integrated Disease Surveillance Programme (IDSP). Operating through the infrastructure of Integrated Public Health Laboratories (IPHL) for human diagnostics and premier regional animal testing facilities-specifically the Veterinary Biologicals & Research Institute (VBRI) and the Animal Disease Diagnostic Laboratory (ADDL) in Vijayawada. This deploys a robust, bidirectional trigger mechanism. Detection of a suspected or confirmed animal case at VBRI or ADDL immediately prompts targeted screening of exposed, high-risk human populations-including farmers, veterinarians, animal handlers, and slaughterhouse workers at the district IPHL.

Conversely, routine human cases confirmed at the IPHL trigger a reverse alert to veterinary counterparts at VBRI and ADDL for immediate field investigations, environmental tracking, and targeted livestock screening. To facilitate this real-time exchange, a unified, secure digital dashboard bridges existing health and veterinary IT networks, ensuring encrypted data governance and automated case alerts. By streamlining sample referral, optimizing transport logistics, and automating bidirectional information flow, this localized pilot bridges historical gaps in inter-sectoral communication. Ultimately, this multi-partner initiative will generate actionable, field-level evidence to establish a scalable, sustainable model for integrated zoonotic disease surveillance across Andhra Pradesh.

Keywords: One Health, Zoonoses, Bidirectional Surveillance, Andhra Pradesh.

ICOH 010

Geospatial Analysis of Dengue Cases in Chitradurga District

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Background: Dengue is an important public health concern requiring timely surveillance, early detection and targeted vector-control measures. Geospatial analysis of surveillance data can identify areas with a higher concentration of cases and support targeted One Health interventions. Objective: To conduct the geospatial analysis of dengue cases in Chitradurga district, Karnataka.

Methods: Data on dengue cases from 2022–2026 were collected from the District Surveillance Unit (DSU), District Health Office (DHO), Chitradurga, through the district dengue surveillance system. The data included information on age, sex, residence, taluk, village/ward and laboratory-confirmed dengue cases. The geographic distribution of dengue cases was analysed at taluk and village/ward levels using Microsoft Excel and geospatial mapping.

Results: A total of 1,895 dengue cases were confirmed from 26,515 suspected cases during 2022–2026. Chitradurga taluk reported the highest number of confirmed cases (n=1,101; 58.1%) and Hosadurga (n=54; 2.8%) lowest. Rural residents accounted for 69% of cases, while males constituted 57.3%. Several villages and wards reported dengue cases across four or more of the five study years, with Chelugudda reporting the highest number of cases among these locations (n=36), followed by Kelagote (n=24) and M K Hatty (n=17).

Conclusion: The geospatial analysis demonstrates considerable geographic variation in dengue occurrence across Chitradurga district. Identification of high-burden and repeatedly affected locations can support targeted vector-control activities, surveillance strengthening and community-based interventions. Integrating geospatial surveillance with vector and

environmental monitoring can strengthen dengue prevention and control through a One Health approach

Keywords: Dengue; Geospatial analysis; One Health Surveillance; Spatial distribution; Vector control

ICOH011

Kyasanur Forest Disease in Hospitalized Patients: Seasonal Patterns, Clinical Course, and Lessons for One Health Preparedness

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Kyasanur Forest disease (KFD) is one of the most endemic zoonotic tick-borne viral hemorrhagic fevers in the Western Ghats of India. In this retrospective study, the epidemiological, clinical, and laboratory characteristics of 108 patients with confirmed KFD virus infection who attended Kasturba Medical College, Manipal, from 2022 to 2025 were assessed. Demographics, district of origin, clinical presentations, seasonality, and patient outcome data were reviewed, and laboratory values at admission and discharge were compared. The subjects were from the following districts: Uttara Kannada (48.1%), Shivamogga (34.3%), Chikkamagaluru (16.7%), and Haveri (0.9%). The mean age was 47.2 years (standard deviation, 20.3; range, 3-83), and the males constituted 68.5%. Adults aged 41-70 years accounted for 61.1% of admissions. There were nine deaths, resulting in a case fatality proportion of 8.3%, seven of which occurred among the subjects from the district of Uttara Kannada. There was seasonality in admissions with a first peak in February-May 2024 and a second, smaller peak in early 2025. All the subjects had fever, followed by thrombocytopenia (89.8%), leukopenia (88.0%), chills (75.0%), generalized weakness (42.6%), vomiting (38.0%), and myalgia (34.3%). There was a significant increase in platelet count and total leukocyte count and a decrease in neutrophils, aspartate aminotransferase, creatinine, and creatine phosphokinase on discharge. Using the One Health approach, integrating human case data from hospitals with tick surveillance and monkey deaths would help guide preparation. Diagnosis at an early stage, clinical observation, and surveillance will remain important for patients and for disease prevention.

Keywords: Kyasanur Forest Disease Virus; Tick-borne; Clinical Patterns; Preparedness: One Health

ICOH 012

Improving Therapeutic Readiness for Kyasanur Forest Disease Using a Subgenomic Research Approach

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The Kyasanur Forest Disease virus (KFDV) is a zoonotic tick-borne flavivirus whose transmission dynamics are highly interconnected within the wildlife-tick-human ecosystem. Therefore, it represents a significant One Health challenge whose continued circulation and geographical expansion call for integrated surveillance and prevention programs as well as therapeutic preparedness. The lack of a specific antiviral treatment, as well as the need for high containment in any infectious virus-related research, poses obstacles to experimental studies. The use of subgenomic systems allows researchers to explore features of interest in viral biology and test antiviral effects; however, few comparable systems are available for KFDV. The purpose of this ongoing study is to develop and assess a subgenomic experimental system for use in KFDV research and future antiviral research. The assessment will be focused on the viability and possible usefulness of the platform for selected experiments using the lessened approach to infectious virus research. The successful establishment and validation of such a platform can serve as a tool for investigating viral elements and conducting early-stage testing of antiviral compounds, while supporting other studies that require high-containment conditions. Even though this system is still in development, this paper aims to fill a significant methodological gap in studies on KFDV. Integration of readily accessible experimental research with both public health and veterinary considerations can help address this novel zoonotic disease threat.

Keywords: Kyasanur Forest Disease Virus, KFDV, Flavivirus, subgenomic system, antiviral research

ICOH 013

Integrating Reverse Genetics with One Health to Strengthen Nipah Virus Research and Outbreak Preparedness

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Nipah virus (NiV) is a high-consequence zoonotic pathogen responsible for recurrent outbreaks in India, highlighting the need for sustained research and coordinated outbreak preparedness. Investigations involving infectious NiV require high containment, limiting

access to experimental facilities and constraining studies of viral biology and potential countermeasures. This presentation examines how reverse genetics and complementary surrogate platforms can support selected research questions within a One Health framework. Systems such as pseudotyped particles and sub-genomic platforms offer opportunities to investigate specific aspects of viral entry or replication and evaluate candidate countermeasures under containment conditions determined by platform-specific risk assessment. These approaches can complement studies of infectious viruses, although they do not fully recapitulate the complexity of infection, transmission, or disease. Connecting experimental findings with epidemiological, veterinary, and ecological evidence may improve understanding of the factors influencing spillover at the animal-human-environment interface. Such integration can help prioritize research questions, guide the interpretation of laboratory findings, and support collaborative evaluation of preventive and therapeutic strategies. Their potential contribution to preparedness depends on appropriate validation and effective exchange of evidence among laboratory researchers, clinicians, veterinarians, ecologists, and public health teams. Integrating molecular research platforms with One Health surveillance and outbreak investigation offers a pathway to strengthen the evidence base for countermeasure development and coordinated responses to Nipah virus emergence.

Keywords: Nipah Virus, One Health, Reverse genetics, Outbreak preparedness, Surrogate virus systems

ICOH 014

Zero Human Deaths Due to Rabies from Dogs by 2030: Overcoming Diagnostic and Preventive Challenges Through One Health Approach

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Rabies continues to be a largely neglected zoonosis that is always fatal upon clinical presentation, even though it is both preventable and treatable using vaccines and post-exposure prophylaxis (PEP). Eliminating human fatalities from dog-transmitted rabies by 2030 will require overcoming the linked challenges of diagnosis, healthcare, animal health, and governance using a One Health strategy. This perspective looks at these barriers and identifies priorities for translating the global elimination agenda into action. Diagnosing rabies before death has not been made easy by the fact that early symptoms are non-specific, viral shedding is inconsistent, and specialized laboratories are few. While molecular methods have advanced diagnostic capabilities, reliable testing might require combining multiple specimens and repeated testing. Such barriers translate into underdiagnosis and poor surveillance. Late

medical consultation, insufficient wound cleaning, failure to complete vaccination programs, and limited access to rabies immunoglobulin all cause unnecessary fatalities. Inadequate dog vaccination, difficulties in accessing roaming dogs, and weak animal surveillance help keep the cycle going. Key priority actions are mass canine vaccination, access to PEP for all, community involvement, management of bite cases, and surveillance of both humans and animals through accountable inter-sectoral collaboration. Antemortem tests that are sensitive, fast, affordable, and minimally invasive should be used to improve case confirmation and surveillance, but the provision of PEP should not be delayed until test results are obtained. The achievement of the 2030 target will rely on integrating diagnostic advances with the prevention of rabies in animal hosts and the protection of exposed individuals.

Keywords: Rabies, One health, Diagnostic challenges

ICOH 015

Exploring the Potential of Wastewater-Based Surveillance for Dengue and Chikungunya viruses : a one health perspective

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Introduction: Dengue and Chikungunya are vector-borne diseases that represent serious public health threats worldwide. Currently, the surveillance approaches mostly focus on monitoring vector populations and their spatial distribution, as well as syndromic surveillance of clinical cases. Recent studies have shown that wastewater treatment plants (WWTPs) can act as potential reservoirs for a range of viruses, including Dengue and Chikungunya.

Objective: To detect the presence of Dengue and Chikungunya virus nucleic acid in wastewater from community and hospital treatment plants using archived nucleic acid. Materials and methods: A total of 695 nucleic acids were analysed, collected between June 2023 and September 2023, and June 2024 and September 2024 using real-time RT-PCR and correlated with clinical cases.

Results: All the samples tested were negative for dengue and chikungunya in wastewater. However, we detected 512 dengue and 24 chikungunya cases in June to September 2023, compared with 927 dengue and 66 chikungunya cases in June to September 2024, among human cases from hospitals using real-time RT- PCR or ELISA.

Conclusion: Even though several studies have reported the presence of dengue and chikungunya nucleic acids in wastewater, our study findings highlight the challenges of detecting arboviral RNA in wastewater and underscore the need for further evaluation of

wastewater-based environmental surveillance as a complementary approach to conventional human and vector surveillance. A large-scale integrated surveillance is crucial for understanding disease transmission.

Keywords: Dengue, chikungunya, wastewater surveillance, real-time RT-PCR

ICOH 016

Temporal and Age-wise Distribution of Anthrax among Cattle in India: A Secondary Data Analysis

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Background: Anthrax, caused by *Bacillus anthracis*, is a zoonotic disease of livestock and a concern for animal and public health in India. Knowing when cases occur and which ages are affected can guide vaccination and surveillance.

Objective: To describe the temporal (year-wise and month-wise) and age-wise distribution of anthrax among cattle in India.

Methods: A secondary data analysis was conducted on a cattle disease dataset of 16,592 records from 2022 to 2024. Records with disease status "Anthrax" were extracted (n = 179). Year, month and quarter were taken from the date, and age in months was grouped into five two-year categories. Numbers and percentages were calculated, and the chi-square test was used to check whether differences were real, with $p < 0.05$ taken as significant. Data were analysed using SPSS.

Results: Anthrax made up about 1% of all records (179 of 16,592). Cases were slightly fewer each year, 67 in 2022, 62 in 2023 and 50 in 2024, but this change was not statistically significant. Cases occurred in every month, with the most in May (21) and the fewest in September (7), and monthly and quarterly differences were also not significant. Affected cattle were aged 2 to 12 years, with an average age of about 7 years (84.6 months). Cases were spread fairly evenly across the five age groups, with the highest number in cattle aged 10 to under 12 years (44 cases), but age groups did not differ significantly.

Conclusion: Anthrax cases were seen in all months and age groups, with no statistically significant difference by year, month, quarter or age group. These results are limited by the short three-year period and the use of sampled secondary data. Future studies should use verified long-term surveillance data with population figures and more variables.

Keywords: Anthrax; cattle; India; temporal distribution; age distribution; secondary data analysis

ICOH 017

Hotspots Analysis of Chikungunya Cases in Chitradurga District

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Introduction: Chikungunya is a mosquito- borne viral disease that exhibits substantial temporal and spatial variation. Identifying localized case concentrations through GIS- based analysis can support targeted surveillance and vector- control interventions. Geographic Information System (GIS) based analysis provide a useful approach for identifying areas with higher concentration of cases and supporting targeted public health responses. Objectives: To assess the temporal and spatial distribution of chikungunya cases and identify geographical hotspots across taluks of Chitradurga district, Karnataka.

Methodology: A retrospective analysis of chikungunya surveillance data obtained from the Health Management Information System (HMIS) available at the District Surveillance Office, Chitradurga District, Karnataka, was conducted for the period from January 2022 to August 2026. Monthly and taluk wise chikungunya case data from six taluks were compiled and analysed descriptively to determine temporal and geographical patterns.

Result: The analysis demonstrated substantial variation in the distribution of chikungunya cases across the six taluks of chitradurga district. Chitradurga taluk accounted for the highest proportion of reported cases (58.4%), followed by Challakere taluk (15.2%), indicating a marked concentration of cases in specific geographical areas. Temporally, the highest proportion of cases was observed during July (13.4%), followed closely by August (13.0%), suggesting an increase in chikungunya occurrence during these months. In terms of residential distribution, 66.4% of reported cases occurred in rural areas, highlighting a greater burden in rural populations. The GIS based analysis further facilitated visualization of the geographical distribution and identification of areas with relatively higher case concentrations.

Conclusion: The findings demonstrate important spatial and temporal variations in chikungunya occurrence in Chitradurga district. The concentration of cases in Chitradurga taluk, the higher occurrence during July and August and the substantial rural burden highlight the need for strengthened surveillance and focused vector- control interventions in high-burden areas.

Keywords: Chikungunya, Hotspot, Secondary data

ICOH 018

At the Forest-Human Interface: Zoonotic Disease Vulnerability among Tribal Communities in India-A One Health Perspective

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Background: Forest-dependent tribal communities in India experience distinctive zoonotic disease risks arising from interactions among human populations, wildlife, vectors, and changing ecosystems. These risks are compounded by livelihood dependence on forests, socioeconomic vulnerabilities, and barriers to healthcare access. Understanding these interconnections is essential for equitable One Health interventions.

Objective: To examine ecological and socioeconomic determinants of zoonotic disease vulnerability among forest-dependent tribal communities in India and explore opportunities for strengthening community-centred One Health approaches.

Methods: A targeted narrative review of selected peer-reviewed literature and national policy documents was undertaken, focusing on zoonotic disease transmission, forest-related exposure, social vulnerability, and integrated surveillance in India. Evidence was synthesised thematically across human-animal-environment interactions and health-system responses.

Findings: Evidence from the Western Ghats demonstrates how forest-dependent livelihoods and socioeconomic conditions shape vulnerability to Kyasanur Forest Disease. Investigations of scrub typhus in Odisha further highlight the role of forest and agricultural exposure in zoonotic transmission. Literature on leptospirosis emphasises the importance of environmental reservoirs and integrated surveillance. Across these examples, ecological exposure intersects with social and institutional vulnerabilities. India's National One Health Mission offers opportunities for multisectoral coordination, although tribal-specific implementation and community participation require further examination.

Conclusion: Addressing zoonotic disease vulnerability among forest-dependent tribal communities requires integrating ecological surveillance, accessible healthcare, culturally appropriate risk communication, and community participation. Incorporating traditional ecological knowledge and strengthening collaboration among health, veterinary, forest, and tribal welfare sectors could support more equitable and context-specific One Health strategies.

Keywords: One Health, Tribal Health, Zoonoses, Forest-dependent Communities, Disease Surveillance, India

ICOH 019

Lead Time of Animal Surveillance Signals Before the First Detected Human Cases of Zoonotic Diseases: A Systematic Review

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Background: Zoonotic diseases are a public-health challenge, and animal surveillance may detect outbreaks before human cases are recognized. However, warning time varies across pathogens, hosts, and surveillance systems, and evidence has not been systematically synthesized.

Objective: To estimate the interval between the first qualifying animal-surveillance signal and the first detected human case in epidemiologically linked zoonotic events, and describe variation by pathogen, host, surveillance modality, and setting.

Methods: This systematic review will follow PRISMA 2020 guidelines. PubMed, Scopus, Embase, Web of Science and Google Scholar will be searched for studies reporting dated animal and human events linked to the same zoonotic event. Using the PECOS framework, human populations are at risk of zoonotic pathogen spillover and epidemiologically linked animal host species involved in zoonotic disease events globally (P) Detection of an animal surveillance signal (E) Date of the first detected or confirmed human index case/cluster from the same linked event, a non-surveillance baseline, delayed/co-occurring human detection, or human syndromic surveillance alone (C) will be assessed for Lead time (T=THumanIndexCase-TAnimalSignalDetection) reported or directly computable in days or weeks (where positive values represent advance warning) (O) in Observational designs, outbreak investigations, surveillance evaluations, and longitudinal studies with dated temporal event sequences (S). Two reviewers will independently screen and extract data, risk-of-bias assessment (ROBINS-I/RoB 2) will be assessed. Findings will be summarized descriptively and narratively; quantitative pooling will be considered if data are comparable. This ongoing review will synthesize evidence on animal-to-human detection intervals to support timely zoonotic disease preparedness.

Conclusion: Animal surveillance signals may provide valuable early warning of emerging zoonotic disease threats before the first detected human cases. Systematic synthesis of the available literature will help characterize and quantify the interval between animal surveillance signals and human case detection, supporting evidence-based evaluation of surveillance timeliness, strengthening One Health surveillance strategies, and informing public health preparedness and early outbreak response.

Keywords: Zoonoses, Animal Diseases, Disease Surveillance, Early Diagnosis, Humans

ICOH 020

Genomic Diversity of Anelloviruses in Multiple Hosts: A Preliminary Phylogenetic Study with One Health Surveillance Implications

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Background: Anelloviridae comprises genetically diverse viruses detected across a broad range of vertebrate and a few invertebrate hosts. Understanding their genomic diversity and distribution across the host may provide insights into viral ecology and help identify priorities for One Health genomic surveillance.

Objective: To explore host-associated genomic relationships among Anelloviruses from different host and assess their potential utility in guiding future One Health Surveillance. Methodology: Publicly available Anellovirus reference records and GenBank sequences were used to develop a preliminary comparative dataset. Host metadata and sequence annotations were reviewed, and an exploratory amino-acid phylogeny was constructed using ORF 1 proteins. Further sequence validation and comparative genomic analyses are planned to characterize host-associated patterns and investigate potentially close genetic relationships across host groups.

Results: Initial dataset assessment revealed uneven representation of host groups and gaps in host-level metadata. Preliminary phylogenetic analyses showed clustering among some viral lineages, although support varied across branches, with several deeper relationships remaining unresolved. These findings highlight the need for systematic sequence validation and quantitative assessment before drawing conclusions about host-associated evolution or potential cross-host viral sharing.

Conclusion: Comparative genomic analysis of Anelloviridae may help prioritize host species and host interfaces for targeted viral surveillance, particularly where closely related viral lineages are detected across different hosts. This could guide future sampling and investigation of cross-host viral circulation within a One Health Framework. Any implications for spillover will require independent ecological and epidemiological validation.

Keywords: Anellovirus; One Health; Comparative genomics; Phylogenetics; Genomic Surveillance

ICOH 021

Delayed and nonlinear associations of climatic factors with Dengue cases in Mangalore: A distributed lag nonlinear model

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Background: Rainfall and temperature may influence dengue transmission by affecting mosquito breeding, development, and viral transmission. These effects may be delayed and nonlinear, highlighting the importance of examining meteorological conditions over time. Objective: To investigate the delayed and nonlinear associations between rainfall, temperature, and monthly dengue cases in Mangalore.

Methods: We analyzed 60 months of dengue case counts, rainfall, maximum temperature, and minimum temperature data using a negative binomial generalized additive model (GAM) incorporating distributed lag nonlinear models (DLNMs). Cross-basis functions were used to characterize nonlinear exposure–response relationships and delayed effects over a three-month lag period. The first three months were excluded because the required historical exposure data were unavailable, leaving 57 monthly observations. Long-term trends and annual seasonality were modeled. Model adequacy was assessed using residual diagnostics and comparisons of alternative model specifications.

Results: A total of 810 dengue cases were recorded during the study period, with a mean of 13.5 ± 10.66 cases per month. Median monthly rainfall was 111.95 mm (IQR:11.9,555), mean maximum temperature was 31.63° ± 2.15°C, and mean minimum temperature was 23.48°±1.27°C. The fitted model explained 77.4% of deviance in monthly dengue cases. Annual seasonality ($p < 0.001$) and long-term temporal trends ($p < 0.001$) were statistically significant. One component of rainfall cross-basis coefficient was statistically significant ($p < 0.001$), whereas the minimum-temperature was not ($p = 0.2482$). Rainfall and maximum temperature were strongly negatively correlated ($r = -0.736$)

Conclusion: Dengue cases showed seasonal and temporal patterns. Findings suggest a delayed association between rainfall and dengue activity; however, further assessment of exposure–lag associations, residual autocorrelation, and model stability is needed before drawing conclusions or developing weather-based early-warning strategies.

Keywords: Dengue, rainfall, temperature, non linear model, seasonality

ICOH 022

Geospatial Mapping and Dog Bite Trends in the Chitradurga distric, Karnataka

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Background: Dog-bite exposures are a public health concern due to the risk of rabies and the need for timely post-exposure prophylaxis. Surveillance can identify patterns and guide One Health interventions.

Objective: To conduct the geo-spatial mapping and trend of dog-bite in the Chitradurga district, Karnataka.

Methods: Data on dog-bite cases from 2021–2025 were collected from the District Surveillance Unit (DSU), District Health Office (DHO), Chitradurga, through the Integrated Disease Surveillance Programme (IDSP) portal. The data had line lists of cases with information on gender, age, village, and total population of the respective village. Geospatial mapping of dog-bite cases across villages was carried out using QGIS, and trends were analysed using Microsoft Excel.

Results: The absolute numbers of dog-bite cases increased from 3,670 in 2021 to 5,474 in 2022, 5,660 in 2023, 7,088 in 2024, and 8,138 in 2025, respectively, representing a total increase of 121.7% from 2021 to 2025. Hiriyur had the highest number of bites (8,308), while Chitradurga had the lowest (2,395). Hiriyur GH reported the highest cases (6,733). The monsoon season (June-September) recorded the highest bites, 9,301, followed by summer (March-May) 7,814, winter (December-February) 7,729, and post-monsoon (October-November) 5,186 cases. Males accounted for 68.7% (20,618) of records, while the 30–44-year age group was the largest, comprising 22.3% (6,696).

Conclusion: The surveillance data demonstrate a rise in reported dog-bite exposures and temporal, demographic, geographic and facility patterns. These findings can support bite-prevention education, timely PEP services, dog vaccination, population management, and coordination between public health and veterinary services, strengthening rabies prevention through a One Health approach.

Keywords: Dog bite, Rabies, One Health, Surveillance, Post-exposure prophylaxis.

ICOH023

Epidemiology and Healthcare Utilization of Reported Dog-Bite Cases in Hassan District, Karnataka: A District-Level Surveillance Study, January 2024 – August 2026

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Background: Transmission of rabies due to dog bites is a serious public health issue due to the high risk and need for early post-exposure prophylaxis. Understanding the demographic pattern, geographic distribution, and healthcare utilization is essential to develop strategies to enhance rabies prevention services.

Objective: To understand the demographic and geographic profile of reported dog-bite cases recorded in Hassan District, Karnataka, with a focus on healthcare utilization across tiers of healthcare facilities.

Methods: This retrospective record-based cross-sectional study analyzed 30,343 registered dog-bite cases from the Integrated Disease Surveillance Programme's electronic registries in Hassan District between January 2024 and August 2026. Records from primary, secondary, and tertiary healthcare facilities were included, while those records lacking baseline demographic information were excluded. Data were analyzed using IBM SPSS Statistics version 29. Demographic characteristics, geographical distribution, and healthcare facility utilization are expressed in frequencies and percentages.

Results: Among 30,343 recorded cases, males accounted for 62.8% (n=19,048). Children younger than 18 years constituted 25.7% of cases (n = 7,791). Among children in the 5–9-year age group, males accounted for 66.5% (n=1,598) of cases. Channarayapatna taluk reported the highest proportion of recorded cases (19.8%; n = 6,016). Cases reported from outside the district accounted for 1.6% (n=491). Primary and secondary healthcare facilities together managed 86.9% of cases (n = 26,363). Pediatric cases constituted a higher proportion of cases at tertiary facilities than at primary healthcare centres (30.1% vs 23.3%).

Conclusion: The present surveillance data revealed a higher burden among males and children. The utilization of primary and secondary public healthcare facilities was substantially higher compared to tertiary care facilities. School-based dog bite-prevention education, community awareness, and ensuring timely access to appropriate PEP are critical for reducing dog bite incidence and preventing rabies. Further research incorporating population exposure circumstances and treatment outcomes is needed to establish age-specific and geographical differences in dog-bite risk and healthcare needs.

Keywords: *Public health, Rabies, Post-exposure prophylaxis, Utilization, Disease surveillance*

ICOH 024

From Progress to Disruption: Unveiling the Hidden Impact of COVID-19 on Tuberculosis Indicators in India

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Background: Tuberculosis (TB) control depends on continuous disease surveillance, timely diagnosis, treatment continuity, and effective monitoring of drug-resistant disease. India had made substantial progress in TB control before the COVID-19 pandemic; however, the pandemic disrupted routine health services and may have altered the trajectory of TB prevention and control. Evaluating these changes is essential for strengthening resilient infectious disease surveillance within a One Health framework.

Objective: This study aims to assess the impact of the COVID-19 pandemic on major TB indicators in India, with particular emphasis on disease surveillance, case detection, paediatric TB, TB–HIV co-infection, drug-resistant TB monitoring, and TB-related mortality.

Methods: Annual data on 13 key TB indicators will be compiled from the India TB Report and World Health Organization estimates for 2000–2023. An interrupted time-series framework will be employed to compare pre-pandemic trends (2000–2019) with the COVID-19 period (2020–2023). Linear generalised estimating equations will be used to account for temporal correlation and estimate changes in indicator levels and trajectories associated with the pandemic. Observed patterns during the pandemic period will be evaluated against expected pre-pandemic trajectories to identify potential disruptions in TB control and surveillance.

Results: The analysis is expected to demonstrate substantial disruption in TB notification, diagnosis, paediatric case detection, drug-resistant TB surveillance, and mortality-related indicators during the COVID-19 period. Differential effects across indicators are anticipated, highlighting areas where surveillance and service continuity may have been particularly vulnerable.

Conclusion: The study is expected to provide evidence on how a major health emergency can disrupt long-term infectious disease control. Findings will support integrated, data-driven surveillance, continuity of TB services, and stronger preparedness strategies for future health emergencies, reinforcing the role of One Health approaches in resilient infectious disease monitoring and control.

Keywords: Tuberculosis; COVID-19; One Health; Disease Surveillance; Interrupted Time-Series Analysis; Drug-Resistant Tuberculosis; Health-System Resilience.

ICOH 025

Prevalence and of Bovine tuberculosis at Cattle–Farm Interfaces Across Climatic Zones of Tamil Nadu and Puducherry

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The *Mycobacterium tuberculosis* complex (MTBC) that are genetically similar and cause tuberculosis in many different hosts and causing severe infectious disease. The major etiological agent of Bovine Tuberculosis (i.e) *Mycobacterium bovis* causes infection in both animals and also in humans through unpasteurized milk, close contact with infected animals and contaminated air. In present study Initial sample collection of milk and nasal swap were collected from the cattle in the selected regions and all environmental metadata were recorded. In order to explore the most contaminant carrier agent for the spread of bovine tuberculosis and prevalence of disease in the initial study area. The first phase of sample collection a total n=17 cattle were selected based on previous TB history, health status and agro climatic zones with high risk factors such as age, breed, sex, type of farming, pregnancy status, parity, and stage of lactation milk production from Chennai, Chengalpattu, Thiruvallur & Pondicherry Districts to collect nasal discharges (n=17) and milk (n=12) that were used. After isolation of samples were transported to BSL3, staining was performed using ZiehlNeelsen (ZN) stain and culture is ongoing using Lowenstein-Jensen medium. Followed by Real Time PCR, Spoligotyping will be performed for positive samples only & Whole Genome Sequence will be used by Illumina platform. The Risk Modelling will be Generated and The findings from this research will provide essential baseline information on bovine tuberculosis in the cattle-farm interface in Tamil Nadu & Puducherry of southern India. These results will enhance the One Health evidence base for monitoring bovine TB and support the creation of informed public health strategies, risk assessment frameworks, and future research efforts.

*Keywords: Bovine Tuberculosis, Mycobacterium bovis, Agro-climatic zones, Nasal swa*p

ICOH 026

M72/AS01E Tuberculosis Vaccine: A Systematic Review of Immunogenicity, Safety, and Efficacy

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Aim: The study aims to review the development, clinical evaluation of the M72/AS01E tuberculosis vaccine for implications for TB control development.

Background: Tuberculosis disease (TB) is one of the leading causes of death in the world with prevalence being as high as 2.5-5% in high risk areas. The currently used BCG vaccine is contraindicated in immunocompromised patients, and is also incompetent in preventing TB infections. The novel TB vaccine M72/AS01E is a promising therapy for long term cellular immunity.

Methods: The study evaluates the drug efficacy by evaluating the synthesized evidence on the M72/AS01E tuberculosis vaccine obtained from randomized controlled trials and programmatic evaluations on the parameters of cellular response, mortality and morbidity risk and side effects.

Results: M72/AS01E has shown reduced mortality and morbidity risk to a significant level across phase 1 and phase 2 trials. Injection-site pain occurs in 34% patients whereas edema is prevalent in 21% and redness is seen in patients which is mostly mild to moderate. M72/AS01E generated strong antibody responses and high responder rates for polyfunctional $CD4^+$ T-cells (typically >60–80% of subjects). In the phase 2b trial, two doses were 50–54% effective in preventing HIV-negative persons with latent infection from developing active pulmonary tuberculosis of around two to three years. In high-burden settings, modeling and WHO/STOP TB evaluations predicted significant declines in TB incidence and mortality if coverage reaches significant percentages of adults and adolescents.

Conclusion:M72/AS01E demonstrates an “favorable safety” with predominantly mild to moderate local adverse effects, robust humoral and polyfunctional CD4+ T-cell immune response and moderate protection against progression to active tuberculosis. These findings support its potential as a promising vaccine which can strengthen TB control in high burden settings to reduce the incidence and mortality rates.

Keywords: M72/AS01E; Tuberculosis; Vaccine efficacy; Immunogenicity; Cellular immunity; Safety

ICOH 027

Before the Next Outbreak: Measuring One Health Readiness for Emerging Zoonotic Threats Among Future Health Professionals

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Background and Objective: Emerging zoonotic diseases require coordinated action across human, animal, and environmental health sectors. The One Health approach emphasizes interdisciplinary collaboration, integrated surveillance, risk communication, and preparedness.

Assessing educational gaps among future health professionals is essential for strengthening the workforce response to emerging infectious threats.

Methods: A focused literature review was undertaken using published studies evaluating zoonotic disease knowledge, One Health awareness, preventive practices, and preparedness among medical and veterinary students. Findings from cross-sectional surveys and studies of One Health education were synthesized descriptively to identify recurring competency gaps and implications for professional training.

Results: Published evidence indicates substantial gaps in zoonotic disease knowledge and preparedness among future health professionals. An Indian study involving 364 medical students and recent graduates found that only 2.8% correctly defined zoonoses, highlighting deficiencies in foundational knowledge. In a multi-university survey of 446 veterinary students in Vietnam, only 9.6% demonstrated good zoonotic disease knowledge, while 26.5% reported good preventive practices. A 2026 survey of 262 veterinary students further identified inadequate experiential learning, limited practical application of public health principles, and gaps in One Health communication and interprofessional collaboration. Collectively, these findings indicate that discipline-specific knowledge alone may be insufficient to ensure effective multidisciplinary outbreak preparedness.

Conclusion: One Health readiness should be developed before, rather than during, the next outbreak. Integrating competency-based zoonotic disease education, simulation-based outbreak exercises, interdisciplinary learning, and practical surveillance and risk-communication training into medical and veterinary curricula may strengthen preparedness. Coordinated educational strategies are essential to building a resilient workforce capable of anticipating and responding to emerging zoonotic threats.

Keywords: One Health; zoonotic diseases; outbreak preparedness; medical education; veterinary education; interprofessional collaboration.

ICOH 028

IL-36 Signaling in Dengue: Relevance to Antiviral Immunity and Therapeutic Development

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Dengue remains a major mosquito-borne public health challenge, with disease severity influenced by interactions between viral replication and host immune responses. Cytokine signaling dysregulation could lead to increased inflammation and vascular damage; elucidating the immunopathogenesis underlying this is important by investigating signaling pathways that affect both the antiviral response and pathogenesis. We investigated the role

of interleukin-36 (IL-36) in dengue, drawing on experimental data from the same pathways in other viral infections. The IL-36 family comprises three agonists, IL-36α, IL-36β, and IL-36γ, together with the IL-36 receptor antagonist, IL-36Ra. The IL-36 cytokines regulate the signaling pathway through the IL-36 receptor. Evidence from experimental studies with herpes simplex virus shows that IL-36 can enhance the type I interferon response by increasing interferon receptor levels and STAT1/STAT2-mediated signaling. In influenza viruses, on the other hand, evidence suggests that IL-36 signaling may be detrimental. Infection with IL-36γ-deficient mice showed poor immune response, while IL-36R-deficient mice had low lung damage and mortality rate in another experimental model. These results indicate that IL-36 signaling may play a role in promoting both viral control and inflammatory tissue injury in dengue virus infection. Its importance, from the perspective of studies carried out on other infections, provides a potential mechanism but not evidence of clinical efficacy. Future directions should involve defining IL-36 signaling across different phases of infection, assessing its association with viral load and disease severity, and determining whether stimulation or inhibition of the pathway elicits an immune response against the virus without causing further inflammation.

Keywords: Dengue; Interleukin-36; Immunity; Therapeutics

ICOH 029

Phytochemicals' computational targeting of monkeypox virus core cysteine protease: The use of an in-silico approach

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The emergence and progression of pathogenic viruses have posed a significant challenge to modern medicine and the global economy, as well as a severe threat to human health. Nearly all of these viruses are zoonotic, indicating they were initially detected in animals before transmitting to humans. An emerging virus may lead to a few isolated cases, resulting in a localized outbreak, or it may cause extensive infection and disseminate globally, instigating a full-scale pandemic. Such developing phenomena have manifested regularly and in many forms during the past few decades. Monkeypox is a zoonotic illness caused by the monkeypox virus, which belongs to the orthopoxvirus family, among variola, cowpox, and vaccinia. Both animals and people are susceptible to it. Resembling smallpox, however exhibiting milder rashes and a reduced fatality rate, the symptoms are markedly analogous. In July 2022, the World Health Organization designated the monkeypox outbreak a global public health emergency. Food and Drug Administration has currently approved tecovirimat, cidofovir, and brincidofovir for the treatment of the monkeypox virus. However, these synthetic

medications may produce some negative effects. Scientists are developing natural therapies as alternatives to these pharmaceuticals. This study employed virtual screening of phytochemicals (N-(2-Allylcarbamoyl-4-chloro-phenyl)-3,4-dimethoxy-benzamide, 6-Dimethylaminonaphthene-1-sulfonic acid amide, Oleic Acid, and dipentyl ester) derived from Allophylus serratus against the core viral cysteine proteases of the monkeypox virus. The docking investigation demonstrated that the chosen ligands interact with the target viral protein, exhibiting binding affinities between -5.0 and -6.7 kcal/mol. N-(2-Allylcarbamoyl-4-chloro-phenyl)-3,4-dimethoxy-benzamide had the highest binding affinity of -6.7 kcal/mol, warranting additional investigation for the design of new therapeutics against the monkeypox virus. This work anticipates that bioactive phytochemicals may serve as template molecules for subsequent experimental assessment of their efficacy against the monkeypox virus.

Keywords: *Monkeypox, Tecovirimat, Docking study, Drugs, Cysteine proteases*

ICOH 030

Global level geospatial analysis of malaria incidence: A secondary data analysis from World Health Statistics

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Background: Global progress against malaria has stalled since 2015, but whether the disease's geographic concentration has changed is less well described. Objective: To describe global trends and spatial clustering of malaria incidence from 2000 to 2024.

Methods: Secondary analysis of WHO Global Health Observatory estimates of malaria incidence (per 1000 population at risk), cases and deaths for 109 endemic countries (2000–2024). Choropleth maps were produced. Spatial autocorrelation was assessed using Global Moran's I and Local Indicators of Spatial Association (LISA), with a k-nearest-neighbour weights matrix (k = 5) and 9,999 permutations (α = 0.05).

Results: Estimated cases rose from 239.5 million in 2000 to 281.7 million in 2024, while deaths fell by 29% (863,523 to 609,930). Global incidence rose from 59 to 64 per 1000 at risk between 2015 and 2024. The African Region's share of cases rose from 84.9% to 94.0%, while the South-East Asia Region's fell from 9.8% to 1.0%. Incidence was strongly spatially clustered in every year (Moran's I 0.74 in 2000 and 0.68 in 2024; $p < 0.001$). LISA hotspots fell from 28 to 23 countries, all in sub-Saharan Africa, and 21 persisted across West and Central Africa. A new coldspot emerged in South-East Asia. Incidence increased in seven countries, most in Madagascar (+201 per 1000). Countries with zero estimated cases rose from 3 to 28.

Conclusion: Malaria remains concentrated in a persistent West and Central African hotspot, while South-East Asia has become a coldspot. Geographically targeted intensification in persistent hotspots and in countries with rising incidence is needed to restore progress.

Keywords: Malaria; Incidence; Spatial Analysis; Cluster Analysis; Global Health

ICOH 031

Current status of *Brugia malayi* foci and its animal reservoir in India: programmatic implications

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Lymphatic filariasis is caused by two human filarial parasites viz., *Wuchereria bancrofti* and *Brugia malayi* in India and is targeted for elimination as a public health problem following the WHO recommended strategies. *B.malayi* accounts for about 10% of the burden of lymphatic filariasis worldwide and in India it accounts for only 0.6%. The national programme to eliminate lymphatic filariasis (NPELF), launched by the Ministry of Health and Family Welfare in 2004 covered 350 districts in 20 states/UT. *B.malayi* endemic in 13 districts in seven states, prior to the launch of NPELF has disappeared in most of the districts and the recent data showed its prevalence in Keralam (one district) and Odisha (four districts) states. While Keralam achieved elimination of *B.malayi* infection from its original endemic district, Odisha is yet to achieve elimination of this parasite specie from all of its endemic districts. Studies in Keralam showed high prevalence of *B.malayi* in domestic dogs, including molecular characterization of *B.malayi*. A recent study on molecular xenomonitoring in two districts in Odisha state which was under post-MDA monitoring, showed *B.malayi* infection in mosquitoes with 2.9% parasite DNA and 18.2% pool positivity. This is above the threshold, indicating the risk of transmission. Though the involvement of animal reservoir in human transmission is not known, zoonotic transmission may lead to possible resurgence of infection. In Keralam, entomological monitoring in a post-MDA district showed 14 out of 69 (20%) *Ma.annulifera* were positive for B.malayi parasite by dissection, but no infective mosquito. Molecular characterization of positive samples confirmed the parasites as *B.malayi*, indicating the risk of resurgence of infection. The implications of possible zoonotic transmission in achieving LF elimination in *B.malayi* areas are discussed. Implementing One Health strategies, test and treat pets, targeted survey of human population and vector management will prevent transmission of zoonotic Brugia species.

Keywords: Lymphatic filariasis, Brugia malayi, one health, xenomonitoring, resurgence

PROJECT One Health™

Theme 2

Antimicrobial Resistance (AMR) & Antibiotic Stewardship across the Human-Animal-Environment Interface

ICOH 032

The invisible threat: multidrug resistant ESBL producing *E. coli* in zoo air and dust samples of Chhattisgarh

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The present study investigated the occurrence of Escherichia coli in air and dust samples collected from three zoos of Chhattisgarh: Maitri Bagh Zoo (MBZ), Kanan Pendari Zoo (KPZ), and Nandan Van Zoo and Jungle Safari (NVZ), with emphasis on multidrug resistance (MDR) and extended-spectrum beta-lactamase (ESBL) production. A total of 180 samples were processed using MacConkey lactose agar, Eosin Methylene Blue agar, and biochemical tests, yielding 102 presumptive E. coli isolates. Molecular confirmation by PCR targeting the 16S rRNA gene confirmed all 102 isolates. Antimicrobial susceptibility testing against 14 antibiotics revealed the highest sensitivity to aztreonam (100%), followed by imipenem (96.07%). Maximum resistance was observed against amoxicillin-clavulanate (93.13%) and tetracycline (83.30%). The multiple antibiotic resistance (MAR) index ranged from 0.07 to 0.57, with 96.07% (98/102) of isolates exhibiting values above 0.2, indicating substantial exposure to environments associated with antimicrobial selection pressure. Phenotypic screening identified 36 ESBL-producing isolates, representing an overall prevalence of 35.29%. Zoo-wise prevalence was highest in NVZ (48.14%; 13/27), followed by KPZ (32.35%; 11/34) and MBZ (29.26%; 12/41). Molecular analysis detected ESBL-associated genes in 23 isolates (22.54%). The blaTEM gene was the most prevalent, whereas blaSHV was detected in only three isolates. Co-occurrence of blaTEM and blaCTX-M was observed in four isolates, blaTEM and blaSHV in one, and all three genes in two isolates. Molecular detection rates were 24.39% in MBZ, 23.52% in KPZ, and 18.51% in NVZ. These findings demonstrate the occurrence of antimicrobial-resistant and ESBL-producing E. coli in zoo environments, highlighting the potential role of airborne and dust-associated contamination in resistance dissemination. Strengthened environmental surveillance, biosecurity, hygiene, and antimicrobial stewardship are essential to mitigate potential risks to wildlife, zoo personnel, and visitors.

Keywords: Escherichia coli; Multidrug resistance; ESBL-producing bacteria; Zoo environment; One Health

ICOH 0033

A One Health Spatial Mapping and Occupational AMR Risk-Reduction Intervention among Urban Solid Waste-Handling Workers in South Bengaluru, India: A Mixed-Methods Study

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Background: Urban solid waste handling creates occupational exposure to potentially contaminated waste, animal-scavenging interfaces and environmental hazards. Despite growing recognition of Anti-Microbial Resistance (AMR) across human, animal and environmental interfaces, Integrated evidence linking occupational determinants, spatial clustering and practical risk reduction remains limited in rapidly urbanizing settings.

Objective: To assess occupational AMR carriage, map spatial risk across One Health interfaces, identify protection barriers and evaluate a targeted risk-reduction intervention in South Bengaluru, India.

Methods: We conducted a four-phase convergent mixed-methods study across 10 purposively selected waste sites within a predefined 10-km radial catchment of a tertiary-care hospital in South Bengaluru. Phase 1 assessed ESBL-producing Escherichia coli and MRSA carriage among 200 solid waste handling workers and 100 community controls using multivariable modified Poisson regression. Phase 2 integrated QGIS-based spatial mapping with 100 soil/leachate and 60 animal-faecal samples to identify One Health risk clusters. Phase 3 explored structural barriers through 20 purposively selected semi-structured interviews with thematic analysis. Phase 4 evaluated a three-month risk-reduction package (AMR education, supervisor training, task-adapted PPE, point-of-work hygiene) across three high-risk sites via pre–post PPE utilization assessment.

Results: ESBL-E. coli carriage was higher among solid waste handling workers than community controls (55.0% [110/200] vs 18.0% [18/100]; PR 3.06, 95% CI 2.02–4.64; $p<0.001$). Among workers, carriage was independently associated with animal-waste contact (aPR 1.58, 95% CI 1.20–2.08), inconsistent glove use (aPR 1.43, 95% CI 1.11–1.84), and informal dumpsite work (aPR 1.29, 95% CI 1.02–1.63). QGIS analysis demonstrated positive spatial autocorrelation of site-level carriage (Moran's I=0.42, p=0.018), with higher-risk sites overlapping areas of substantial animal scavenging. Qualitative analysis identified heat discomfort, economic constraints and perceived institutional marginalization as key barriers to occupational protection. Following the three-month intervention, consistent PPE utilization increased by 64%.

Conclusion: Urban solid-waste environments may represent important spatially clustered One Health interfaces for occupational AMR risk. A targeted risk-reduction intervention was feasible and associated with improved PPE utilization, supporting a potentially scalable approach to occupational AMR prevention within municipal solid-waste systems in rapidly urbanizing settings.

Keywords: Antimicrobial resistance; One Health; Occupational Health; ESBL-producing Escherichia coli; QGIS; spatial epidemiology

ICOH 034

Bridging the Clinical-Environmental Interface in Urinary Tract Infections: Multi-Drug Resistance Patterns and MARI Profiling among Diabetic and Non-Diabetic Patients in a Tertiary-Care Hospital of Gujarat, India

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Antimicrobial resistance (AMR) remains a critical global threat, particularly within urinary tract infections (UTIs) where empirical antibiotic use is common and diabetic patients are disproportionately affected. This cross-sectional study investigated the prevalence of uropathogens, multi-drug resistance (MDR) patterns, and Multi-Antibiotic Resistance Index (MARI) values among diabetic and non-diabetic UTI patients in a tertiary-care hospital in Gujarat, India. Uropathogens were identified using standard microbiological methods and antibiotic susceptibility testing, while environmental samples were collected from hospital low-touch and high-touch surfaces to assess their contribution to resistant organism dissemination. Among all processed UTI samples, Escherichia coli predominated (78%), followed by Enterococcus spp. (9%), Klebsiella spp. (8%), other Gram-negative organisms (3%), Pseudomonas aeruginosa (1%), and Candida spp. (1%). Diabetic patients demonstrated a higher incidence of MDR isolates and significantly elevated MARI values compared with non-diabetic individuals, indicating greater antibiotic pressure and increased exposure to resistant reservoirs. Environmental surveillance showed that high-touch areas harboured a substantially greater load of AMR organisms than low-touch sites, implicating these surfaces as potential environmental reservoirs facilitating cross-transmission. The integration of patient-level microbiological findings with environmental resistance data highlights the complex interplay between host vulnerability, pathogen ecology, and environmental persistence within healthcare settings. These findings underscore the need for strengthened infection-prevention practices, routine environmental monitoring, and targeted antimicrobial stewardship strategies, particularly for high-risk populations such as diabetics. Implementing these measures could significantly mitigate AMR burden, reduce infection

recurrence, and support evidence-based interventions in resource-limited hospital environments

Keywords: Antimicrobial Resistance, Bacteriology, Uropathogens, Urinary Tract Infection, Environmental surveliance

ICOH 035

From Food to Public Health: Unveiling ESKAPE Pathogens in the Food Supply Chain

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Background: ESKAPE pathogens are important bacterial pathogens associated with antimicrobial resistance (AMR) and healthcare associated infections. Their occurrence in food and food associated environments may provide opportunities for transmission beyond healthcare settings. However, limited information is available on their occurrence and associated food safety risks in the food supply chain of Bhubaneswar, India. A One Health approach can help understand the interface between food, environmental contamination, AMR, and public health.

Methods: An ongoing cross-sectional study is being conducted in Bhubaneswar, Odisha, involving food and environmental samples collected from local markets, street-food vending units, and food establishments. Samples are being processed using selective culture, isolation, biochemical identification, antimicrobial susceptibility testing, PCR for molecular confirmation and multiplex PCR for resistance gene. A knowledge, attitude and practice (KAP) assessment is also being conducted among food handlers using a structured questionnaire and observational assessment of hygiene practices.

Preliminary Results: To date, 70 food and environmental samples have been collected. Preliminary identification indicated multiple bacteria genera with Enterococcus spp. (76.9%), Pseudomonas spp. (69.2%), Escherichia coli (49.2%), Staphylococcus spp. (38.5%) Citrobacter spp. (18.5%), Klebsiella spp. (13.8%), Shigella/Salmonella like isolates(12.3%), Enterobacter spp.(9.2%), Acinetobacter spp. (4.6%), and Vibrio spp. (3.1%). Antimicrobial susceptibility testing and molecular confirmation are ongoing. KAP information has also been collected from 40 food handlers, indicating gaps in food safety training and hygiene practices.

Conclusion: The study aims to generate evidence on foodborne ESKAPE pathogens, AMR, and food hygiene practices within the Bhubaneswar food supply chain. The findings may contribute to strengthening foodborne pathogen surveillance and AMR monitoring through a One Health framework.

Keywords: ESKAPE pathogens, Antimicrobial Resistance, Food Safety, One Health, Bhubaneswar

ICOH036

Prevalence, patterns and determinants of antibiotic use among the residents of Ballabgarh block of Faridabad district, Haryana : A mixed methods study

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Background: Antibiotics are among the most commonly prescribed medicines worldwide. Increased and inappropriate antibiotic use contributes to the development of antimicrobial resistance which is a growing public health threat with significant global economic and security implications.

Objectives: To estimate the prevalence of antibiotic use and assess the pattern and determinants of antibiotic use among the general population as well as the perceptions and practices regarding antibiotic use among various stakeholders.

Methods: A community based mixed method study was conducted in Ballabgarh, Haryana. A household survey was conducted among 360 households. An adult respondent provided details of any illness with medicine use by members of the household in the preceding three months. Antibiotic use was confirmed by the presence of prescription; left-over medicines or pack; recall of name; or identification from show cards. Antibiotic use was considered inappropriate if not taken on the advice of a doctor, or if taken for longer or shorter period than advised. In-depth interviews were conducted with 20 community members, 10 pharmacists , and 10 doctors regarding the perception and practices of antibiotic use, sale and prescription in the community.

Results: Of the total 1728 members of the households included in the study, the proportion who used antibiotics at least once in the past 3 months was 5.6% (CI 4.2-6.9%).Among 105 episodes of antibiotic use,78.1%(CI 69.9- 86.3%) was inappropriate. In-depth interviews revealed health system related issues like lack of access poor provider practices, regulatory issues, market forces and community related factors like lack of awareness as major drivers of antibiotic use and resistance.

Conclusion: The prevalence of inappropriate antibiotic use is high in the community. Antibiotic use in is driven by the interplay of individual, health system, market and regulatory factors. Curbing antibiotic resistance demands strengthening of the health system, ensuring the accessibility to affordable and qualified health care providers along with strict enforcement of regulatory policies on dispensing practices.

Keywords: antibiotic use; antibiotic resistance; antimicrobial resistance; inappropriate antibiotic use; mixed methods study

ICOH037

Knowledge, Attitudes and Practices Regarding Antimicrobial Resistance Among Adults Attending a Tertiary Care Hospital in Kamrup, Assam:

A One Health Perspective

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Background: Antimicrobial resistance (AMR) is driven by antibiotic misuse across human, animal and environmental sectors, and public awareness is central to a One Health response. Community data from Northeast India are scarce.

Objective: To assess AMR awareness, knowledge, attitudes and practices among adults attending a tertiary hospital, and public perception of antibiotic use across human and animal sectors.

Methods: This cross-sectional study was conducted in the outpatient departments of AIIMS Guwahati, Assam, in August 2026. Adults aged 18-64 years (patients and attendants) were recruited by convenience sampling (N=164) and interviewed with a semi-structured questionnaire. Awareness (0-5), knowledge (0-17), practice (0-5) and attitude (14-70) scores were constructed. Associations were assessed using chi-square tests, Spearman correlation and multivariable logistic regression.

Results: Of 164 participants, 68.9% were male and 45.7% rural. Only 56.1% had heard of any AMR term; median knowledge was 7/17 and 11.6% had adequate knowledge. Although 72.6% obtained antibiotics on prescription, 45.7% would stop once feeling better. Knowledge, attitude and practice scores were positively correlated (rho 0.28-0.33), and women had lower knowledge (adjusted OR 0.48, 95% CI 0.24-0.96). Across sectors, 89.0% endorsed prescription-only use in people, but only 64.6% supported reducing antibiotics in food animals ($p<0.001$). Just 47.6% believed antibiotics are widely used in local agriculture and 39.0% did not know; recognition was associated with higher knowledge (adjusted OR 3.37, 95% CI 1.73-6.57). Support for reducing farm antibiotic use was 79.5% among those who recognised agricultural use but 46.9% among those who did not know ($p<0.001$).

Conclusion: Support for responsible antibiotic use is strong for people but weaker for animals, and limited awareness of agricultural use may contribute to this gap. One Health AMR communication should link human, animal and environmental antibiotic use, beginning with basic AMR education and reaching women.

Keywords: antimicrobial resistance; One Health; knowledge, attitudes and practices;

ICOH038

In Vitro Evaluation of the Antibacterial Potential of Bergenia ciliata Extract against Multi Drug Resistant Staphylococcus aureus isolates from Bovine Mastitis

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Bovine mastitis, an inflammatory disease of the mammary gland, causes annual global losses of approximately $13 billion in dairy herds. It is caused by a range of microorganisms, predominantly bacteria, with *Staphylococcus aureus* being the most common causative agent. The emergence of multidrug-resistant (MDR) and methicillin-resistant (MRSA) strains, together with biofilm formation, limits the efficacy of conventional antibiotic therapy for treatment of clinical mastitis. Medicinal Plant-derived extracts are being explored as alternative agents, and *Bergenia ciliata* (Zakham-e-hayat), a Himalayan medicinal plant, has documented antibacterial activity. In the present study, ten *S. aureus* isolates recovered from bovine mastitis cases were confirmed by Gram staining, PCR and screened as multidrug-resistant (MDR-SA) authenticaed by NCVTC Haryana showing resistance to penicillin G, methicillin, erythromycin and ciprofloxacin, prior to in vitro evaluation of the antibacterial, antibiofilm, and cytotoxic potential of methanolic root extract of *B. ciliata* against these isolates. Antibacterial activity was assessed by agar well diffusion and broth microdilution assays for determination of the minimum inhibitory concentration (MIC), antibiofilm activity by the crystal violet microtiter plate assay, and cytotoxicity by the MTT assay on Vero cells, with cell viability further confirmed by 7-AAD staining of bovine PBMCs using flow cytometry. The effect of the extract on bacterial cell morphology and biofilm architecture was examined by scanning electron microscopy (SEM). Data were analysed using one-way ANOVA followed by Tukey's or Dunnett's post hoc test ($p < 0.05$). The extract produced a mean zone of inhibition of 20.39 ± 0.609 mm, compared with vancomycin (18.00 ± 0.00 mm) and enrofloxacin (14.67 ± 0.595 mm), with a uniform MIC of 1.95 mg/mL across all isolates, while solvent controls showed no inhibitory activity. Biofilm formation was inhibited by 97.5–99.3% at 20 mg/mL, and pre-formed biofilm was disrupted by about 80–87% at the same concentration. No cytotoxicity was observed on Vero cells up to 100 mg/mL after 24 or 48 hours of exposure, and PBMC viability remained at 84.3% at 100 mg/mL, above the ISO 10993-5 threshold of 70%. SEM showed that untreated bacteria cells were smooth, spherical and arranged in grape-like clusters within a dense biofilm. Extract-treated cells (20 mg/mL, 24 h) were shrunken and irregular with rough, damaged cell walls, and treated biofilms were markedly thinner with visible gaps and porous regions, indicating disruption of cell integrity and biofilm architecture. These results indicate

that *B. ciliata* extract exhibits significant antibacterial and antibiofilm activity against MDR S. aureus from bovine mastitis, with a favourable in vitro safety profile, supporting its potential as a plant-based therapeutic alternative.

Keywords: Bergenia ciliata, Bovine Mastitis, Multidrug Resistant Staphylococcus aureus (MDR-SA), Medicinal Plants, Scanning Electron Microscopy.

ICOH 039

Detection and Antimicrobial Susceptibility Testing of Klebsiella pneumoniae isolated from Poultry in Central Kashmir

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Klebsiella pneumoniae, an opportunistic Gram-negative bacterium is increasingly recognised for its ability to acquire antimicrobial resistance highlighting its significance in veterinary medicine and public health. Antimicrobial resistance (AMR) has emerged as a major global health concern, posing significant challenges to the treatment of bacterial infections in humans and animals. The emergence of antimicrobial-resistant bacteria in poultry is of particular importance due to their potential dessimination through the food chain, direct contact, and environmental pathways. The present study aimed to detect and identify *K. pneumoniae* in poultry samples collected from Central Kashmir using microbiological tests and VITEK system, confirming isolates using Polymerase Chain Reaction (PCR) targeting the 16S-23S ITS and antimicrobial susceptibility testing (AST) was performed to determine the susceptibility of confirmed isolates to selected antimicrobial agents. Antimicrobial susceptibility testing revealed that highest susceptibility was observed against Amoxiclav and Cefepime, followed by ceftriaxone, gentamicin, imipenem, enrofloxacin and tetracycline and highest resistance was observed against enrofloxacin followed by gentamicin tetracycline, ceftriaxone and imipenem. In conclusion, the detection and antimicrobial susceptibility testing of *K. pneumoniae* in poultry are important for monitoring resistance patterns and promoting the rational use of antimicrobial agents. Continued surveillance, effective farm biosecurity, and responsible antimicrobial use are essential components of the One Health approach to limiting the emergence and spread of antimicrobial resistance across animal, human, and environmental sectors.

Keywords: Klebsiella pneumoniae, Poultry, Antimicrobial resistance, VITEK, One Health.

ICOH 040

Molecular characterization of antibiotic-resistant Escherichia coli isolated from layers in Namakkal district, Tamil Nadu

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Antibiotic resistance in poultry-associated bacteria represents a critical One Health challenge, as resistant pathogens can propagate through production systems and reach human populations via environmental and food-chain pathways. This pilot study was designed to investigate the antibiotic resistance profiles and identify specific resistance genes in Escherichia coli strains isolated from commercial layer chickens in Namakkal, Tamil Nadu, India. A total of 100 cloacal swab samples from healthy layer chickens were examined using standard cultural, biochemical and molecular methods. Out of these, 63 samples (63.0%) were confirmed positive for E. coli. Susceptibility testing via the disc diffusion method showed resistance against co-trimoxazole (66.66%), tetracycline (57.14%), ampicillin (53.96%), doxycycline (34.84%), ciprofloxacin (28.57%), streptomycin (17.46%), ceftriaxone (15.87%), norfloxacin (15.87%), ofloxacin (15.87%) and erythromycin (11.11%). Resistance to amikacin, amoxicillin, amoxycillin-clavulanic acid and furazolidone was 1.58% each, while no resistance to colistin sulphate was detected. Subsequent molecular screening via polymerase chain reaction revealed the presence of tetA, blaTEM and sul1 genes in 47.22%, 36.11% and 28.57% of the tested isolates, respectively. These findings confirm the occurrence of antibiotic-resistant E. coli carrying critical resistance genes in layer poultry. From a One Health perspective, strengthening farm biosecurity, antimicrobial stewardship and surveillance is essential to limit the dissemination of these resistant bacteria across the animal-human-environment interface.

Keywords: Escherichia coli, layers, antibiotic resistance, resistance genes

ICOH 041

Prevalence and Antimicrobial Susceptibility Pattern of Escherichia coli Isolated from Cloacal Swabs of Apparently Healthy Live Broiler Chickens in Chitwan District, Nepal

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Background: Antimicrobial resistance (AMR) is a public health concern, and poultry can carry resistant bacteria that may reach people through food, farm contact and the environment. This study determined the prevalence and antimicrobial susceptibility pattern of Escherichia coli in apparently healthy live broiler chickens in Chitwan District, Nepal.

Methods: A cross-sectional study was conducted over one month. Using purposive sampling, 360 cloacal swabs were collected from 72 commercial broiler farms (flock size ≥1,000) across the seven local levels of Chitwan, with five birds sampled per farm. Birds were older than 25 days and had no prior antibiotic use. Samples were enriched in peptone water and cultured on MacConkey and eosin methylene blue agar, and *E. coli* was identified by colony morphology, Gram staining and biochemical tests. Susceptibility to eight antimicrobials (amikacin, gentamicin, doxycycline, tetracycline, ciprofloxacin, levofloxacin, co-trimoxazole and enrofloxacin) was tested by Kirby–Bauer disc diffusion and interpreted using CLSI (2025) criteria. Multidrug resistance (MDR) was defined as resistance to at least one agent in three or more antimicrobial classes.

Results: *E. coli* was isolated from 242 of 360 samples (67.22%). Prevalence ranged from 62.22% in Ratnanagar to 71.82% in Bharatpur. Resistance was highest to doxycycline (85.12%), tetracycline (77.27%) and co-trimoxazole (76.03%), followed by levofloxacin (64.05%), ciprofloxacin (61.98%) and enrofloxacin (51.65%). Resistance was lowest to gentamicin (14.88%) and amikacin (9.09%). Of the 242 isolates, 117 (48.35%) were multidrug resistant.

Conclusion: Resistant *E. coli* was common in apparently healthy broilers in Chitwan. Resistance to tetracyclines, co-trimoxazole and fluoroquinolones was high, while amikacin and gentamicin showed comparatively low resistance. These findings are phenotypic and come from one district, so they should not be generalised to all of Nepal. They support prudent antimicrobial use under veterinary guidance, susceptibility testing before treatment, and continued AMR surveillance within a One Health approach.

Keywords: Escherichia coli, antimicrobial resistance, broiler chickens, multidrug resistance, One Health

ICOH 042

From Cattle Resistomes to One Health Surveillance: Opportunities and Challenges for Machine Learning

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Antimicrobial resistance (AMR) surveillance requires an understanding of how animal management, microbial communities, and environmental conditions influence resistance. Beef cattle systems provide an important setting for examining these relationships, as antimicrobial use, manure management, and food production connect animal health with broader One Health concerns. Although sequencing can identify antimicrobial resistance genes, translating these findings into useful surveillance information remains challenging. This narrative

overview examines how machine learning can support the analysis of cattle microbiome and resistome data. Potential applications include identifying resistance-associated microbial patterns, tracking changes over time, predicting resistance phenotypes, and prioritizing findings for further investigation. Particular attention is given to integrating genomic profiles with antimicrobial exposure, animal health, diet, and farm management information. Several challenges limit the interpretation and transferability of these approaches. Small datasets, inconsistent metadata, repeated sampling, and differences between farms can produce misleading performance estimates. Furthermore, detecting a resistance gene does not necessarily establish phenotypic resistance, transmission between hosts, or a direct risk to human health. These distinctions are essential when communicating computational findings to producers, veterinarians, and public health professionals. A useful One Health approach should combine standardized metadata, transparent analytical workflows, appropriate validation, and collaboration across disciplines. Linking cattle resistome studies with environmental sampling and laboratory susceptibility testing could strengthen the interpretation of emerging patterns. Machine learning can contribute to this process by identifying associations and supporting targeted investigation, while biological evidence and practical context remain necessary for surveillance and stewardship decisions.

Keywords: One Health; Antimicrobial Resistance; Beef Cattle; Machine Learning; Resistome Surveillance.

ICOH 043

A narrative review for one health surveillance: Antimicrobial resistance in wastewater and livestock-associated food systems in India

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Introduction: Antimicrobial resistance (AMR) is a critical One Health concern affecting human, animal and environmental health. Two important settings where antimicrobial-resistant bacteria and antimicrobial resistance genes have been found are wastewater systems and livestock-associated food systems.

Objective: To collate recent evidence on antimicrobial resistance (AMR) in wastewater and livestock-associated food systems and identify implications for One Health surveillance.

Method: This narrative review was based on relevant research articles published between 2024 and 2026 identified through PubMed. Articles related to antimicrobial resistance in wastewater and wastewater treatment systems, livestock-associated food systems and Human-animal-environment interfaces were identified, read, and compared. Findings were

qualitatively synthesized, focusing on study settings, resistant organisms, resistance genes and comparisons between settings.

Result: The review identified antimicrobial resistance genes in sewage and wastewater treatment systems, and some resistance determinants were still found in treated wastewater. Studies of livestock-associated food systems reported extended-spectrum beta-lactamase (ESBL)-producing Escherichia coli in poultry and cattle farms. Comparative findings varied: some studies showed similarities in resistance patterns between strains isolated from humans and food samples, while genomic evidence from Vellore provided limited evidence of spillover of antimicrobial-resistant Klebsiella pneumoniae from animals or the environment to humans. Overall, antimicrobial resistance was reported in several settings, but the available evidence did not establish a consistent pathway of transmission between them.

Conclusion: The available evidence highlights the presence of antimicrobial resistance in wastewater and livestock-associated food systems in India, while the relationships between resistance observed across human, animal, and environmental settings remain unclear. These findings emphasize the importance of coordinated One Health surveillance, integrating environmental monitoring, food-chain surveillance, genomic comparisons and antimicrobial-use data to better understand potential connections between these settings.

Keywords: Antimicrobial resistance, One Health, Wastewater, Livestock, Environmental surveillance.

ICOH044

Antimicrobial resistance at the Human-Animal-Environment Interface: A One Health Perspective

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Antimicrobial resistance (AMR) is a major global health concern because it reduces the effectiveness of antimicrobial agents against resistant microorganisms. Although resistance to antimicrobial agents is a natural process, but increasing number of resistant organisms poses a significant problem in the treatment of infectious diseases. AMR exists in humans, animals, and in the environment, and the interconnection between the three sectors highlights the importance of the One Health Approach. This review aims to examine the occurrence of AMR across humans, animals, and the environment, focusing on potential transmission pathways and interconnections between the three sectors. Relevant published literature on antimicrobial resistance across human, animals, and the environment was reviewed to understand current evidence and the knowledge gaps existing in the field. The reviewed literature suggests the presence of resistance among humans, animals, and environmental

settings, although the extent and pathways of transmission is not completely understood. Another important finding is that wastewater treatment plants act as both barriers to the spread of AMR while also serving as a potential reservoir of antimicrobial resistance genes (ARGs), as certain genes may persist after treatment. A coordinated One Health Approach is needed to combat the growing threat of Antimicrobial Resistance by rational use of drugs in humans and animals, along with better monitoring systems for wastewater treatment plants.

Keywords: Antimicrobial resistance (AMR), One Health, Human-Animal-Environment interface, Wastewater treatment, Antimicrobial resistance gene (ARGs)

ICOH 045

Bacteriological Profile and Antimicrobial Resistance Pattern of Bacterial Isolates from Wound Infections in Selected Hospitals, Mogadishu, Somalia

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Background: Wound infections are a significant healthcare challenge in resource-limited settings like Mogadishu, Somalia. Understanding local bacteriological profiles and antimicrobial resistance (AMR) patterns is crucial for guiding treatment. This study aimed to investigate the prevalence, distribution, and AMR profiles of bacterial isolates from wound infections in selected hospitals in Mogadishu.

Methods: A cross-sectional study was conducted from September 2022 to August 2023 across two hospitals (Liibaan and Shaafi). Wound swab samples were collected from 150 patients with wound infections. Microbiological analysis included bacterial identification and antibiotic susceptibility testing. Sociodemographic data were also collected via questionnaire.

Results: The study revealed a diverse bacteriological profile. Out of 150 samples, 90 (60%) showed bacterial growth. Gram-negative bacteria predominated (61.2%), including Escherichia coli (21.1%), Pseudomonas spp. (17.8%), and Klebsiella spp. (12.2%). The most common Gram-positive isolate was Staphylococcus aureus (28.9%). AMR analysis revealed high resistance rates to commonly used antibiotics, including beta-lactams, fluoroquinolones, and aminoglycosides. Notably, extended-spectrum beta-lactamase (ESBL) production was detected in a notable proportion of Gram-negative isolates. Vancomycin, linezolid, and clindamycin were most effective against S. aureus, while amikacin and meropenem were most effective against Pseudomonas.

Conclusion: This study highlights the urgent need for effective antimicrobial stewardship programs and infection control measures to mitigate rising AMR in Mogadishu. Improved

surveillance systems, laboratory capacity, and access to appropriate antibiotics are vital to combat this public health threat.

Keywords: Antimicrobial Resistance, Wound Infection, Bacterial Isolates, Mogadishu, Somalia

ICOH 046

Environmental surveillance of β-Lactam-Resistant Enterobacterales and associated resistance genes in community and healthcare water sources in Mysuru,South India

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Environmental water sources may serve as reservoirs of antimicrobial resistance (AMR), facilitating the dissemination of resistance determinants. This study investigated β-lactam-resistant Enterobacterales and associated resistance genes in community- and healthcare-associated water sources in Mysuru, South India. A cross-sectional study was conducted from September 2025 to June 2026. Of 304 water samples, 219 were collected from community-associated sources and 85 from healthcare-associated sources. Bacterial isolates were recovered using MacConkey agar and identified by conventional methods. Antimicrobial susceptibility was assessed using Kirby–Bauer disc diffusion. Isolates resistant to third-generation cephalosporins were screened for extended-spectrum β-lactamase (ESBL) and AmpC production, while carbapenem-resistant isolates were assessed for carbapenemase production. Quantitative polymerase chain reaction targeted ESBL genes (blaCTX-M-15, blaTEM, blaSHV), AmpC genes (blaCMY-2, blaDHA), and carbapenemase genes (blaKPC, blaNDM, blaIMP, blaVIM, blaOXA-48). Community-associated water sources yielded 378 bacterial isolates, including 276 Enterobacterales and 102 non-Enterobacterales. Nineteen β-lactam-resistant Enterobacterales were identified (6.9% of 276), including four resistant to third-generation cephalosporins alone and 15 resistant to both third-generation cephalosporins and carbapenems. Healthcare-associated water sources yielded 105 isolates, comprising 70 Enterobacterales and 35 non-Enterobacterales. Of the 70 Enterobacterales, 27 were β-lactam-resistant (38.6%), including 10 resistant to third-generation cephalosporins alone and 17 resistant to both antibiotic groups. Among the 19 community-associated resistant isolates, blaCTX-M-15 was detected in 9 (47.4%), blaTEM in 1 (5.3%), blaCMY-2 in 2 (10.5%), blaNDM in 10 (52.6%), and blaOXA-48 in 11 (57.9%). Corresponding counts among healthcare-associated isolates (n = 27) were 15 (55.6%), 2 (7.4%), 4 (14.8%), 12 (44.4%), and 5 (18.5%), respectively. Some isolates harboured multiple resistance genes. The genes blaSHV, blaDHA, blaKPC, blaVIM, and blaIMP were not detected. β-lactam-resistant Enterobacterales carrying clinically important resistance genes were detected in both settings,

highlighting the need for environmental AMR surveillance and integrated One Health interventions.

Keywords: Antimicrobial resistance, Enterobacterales, β-lactam resistance genes, One Health, Water sources

ICOH047

Antimicrobial Resistance at the Companion Animal–Human–Household Interface: A One Health Perspective

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Background: While the role of livestock in the food-borne transmission of antimicrobial resistance (AMR) is well-established, the impact of companion animals is increasingly significant. The proximity and cohabitation between pets and owners may facilitate the bidirectional exchange of bacteria and resistance genes within shared domestic environments. Consequently, addressing these dynamics necessitates a One Health framework that integrates human, animal, and environmental health.

Objective: This project aims to examine evidence of shared antimicrobial-resistant bacteria and resistance genes among companion animals, their owners, and the household environment, with particular attention to potential transmission pathways and the limitations of current evidence.

Methods/Approach: A focused narrative review of selected literature will be undertaken, using the study by Yang et al. on cats, their owners, and their living environment as a starting point. The review will discuss key findings on antimicrobial resistance among companion animals and humans sharing the same household, considering potential transmission pathways, important limitations, and implications for One Health.

Expected Outcomes: The review is expected to summarize current evidence on the sharing of antimicrobial-resistant bacteria and resistance genes within households and identify gaps in surveillance. It will also highlight the importance of raising awareness, communicating effectively with pet owners, and promoting responsible antibiotic use in companion animals.

Conclusion: Understanding antimicrobial resistance among companion animals, humans, and their shared environment requires a One Health approach. Collaboration across veterinary, medical, and environmental sectors is essential to address surveillance gaps, support responsible antibiotic use, and guide prevention efforts within households.

Keywords: antimicrobial resistance; companion animals; household environment; One Health; antimicrobial stewardship.

ICOH048

Fabrication and dose-dependent evaluation of zinc oxide nanoparticle-coated urinary catheters for antibacterial and antibiofilm applications against *Pseudomonas aeruginosa*.

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Catheter-associated infections (CAIs), primarily driven by bacterial biofilm formation on indwelling medical devices, represent a critical clinical challenge due to their association with heightened morbidity, mortality, and multidrug resistance (MDR). The increasing prevalence of antimicrobial resistance highlights the need for alternative strategies to reduce bacterial colonization and biofilm development on catheter surfaces. The present study evaluated the dose-dependent antibacterial and antibiofilm activity of zinc oxide nanoparticles (ZnO NPs) incorporated as a surface coating for urinary catheters. ZnO nanoparticles were synthesized using a sol-gel method with selected capping agents and characterized using dynamic light scattering, scanning electron microscopy, and X-ray diffraction. The synthesized nanoparticles exhibited a crystalline wurtzite hexagonal ZnO structure, with an optimized hydrodynamic particle size of 42.4 nm. Sterile catheter segments were coated with different concentrations of ZnO nanoparticles using a dip-coating approach. The antimicrobial efficacy of ZnO NPs was assessed using the agar well diffusion assay against representative CAI pathogens, including Pseudomonas aeruginosa. Zones of inhibition were recorded following 18–24 hours of incubation with values increasing from 9 to 18 mm for the reference strain and reaching 16–17 mm among the clinical isolates at the highest concentration. Antibiofilm activity was evaluated using catheter segments coated with 1.0, 2.5, and 5.0 mM ZnO NPs followed by crystal violet biofilm quantification. Biofilm inhibition increased progressively from 27.1% at 1.0 mM to 76.5% at 5.0 mM. Statistical analysis demonstrated significant concentration-dependent differences in both antibacterial and antibiofilm activity. Overall, ZnO nanoparticle coating demonstrated promising in-vitro antibacterial and antibiofilm potential against P. aeruginosa, with the highest concentration producing the greatest inhibition. These findings support further investigation of ZnO-based catheter surface modification as a potential strategy for controlling biofilm-associated catheter infections.

Keywords: Zinc oxide nanoparticles (ZnO NPs), Catheter-associated infections (CAIs), Biofilm inhibition, Antibacterial activity, and Sol–gel synthesis.

ICOH 049

Prevalence, Microbial Profile and Antimicrobial Resistance Pattern of Central Line-Associated Bloodstream Infections in a Tertiary Care Hospital.

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Background: Central line-associated bloodstream infection (CLABSI) is a major healthcare-associated infection associated with prolonged hospitalisation, increased morbidity and mortality, and substantial antimicrobial use. The emergence of multidrug-resistant organisms further complicates the management of CLABSI, particularly in intensive care settings. This study evaluated the prevalence, microbial profile and antimicrobial resistance pattern of CLABSI in a tertiary care hospital.

Methods: A prospective observational study was conducted over six months from September 2025 to March 2026 in the intensive care unit of a tertiary care hospital. A total of 1,765 ICU admissions were recorded, of which 1,003 patients with invasive devices were monitored for device-associated infections. Clinically suspected CLABSI cases were investigated using aseptically collected blood specimens. Microorganisms were identified using conventional microbiological methods and automated identification systems. Antimicrobial susceptibility testing was performed using VITEK-2 according to standard laboratory protocols. Multidrug-resistant phenotypes, including methicillin-resistant Staphylococcus aureus (MRSA) and carbapenem-resistant Enterobacterales (CRE), were identified using standard laboratory criteria. Descriptive statistical analysis was performed.

Results: Among 106 device-associated infection episodes identified during the study period, 30 were classified as CLABSI, accounting for 28.30% of all device-associated infections, with a reported prevalence of 5.80%. Microbiological investigation yielded 27 isolates. Staphylococcus aureus was the predominant isolate, comprising 8 isolates (29.63%), followed by *Klebsiella pneumoniae* with 6 isolates (22.22%). Other organisms accounted for 13 isolates (48.15%). K. pneumoniae demonstrated high levels of resistance to several commonly used antimicrobials, including meropenem, piperacillin–tazobactam, ciprofloxacin and multiple cephalosporins, with carbapenem-resistant strains identified. *Acinetobacter baumannii* also demonstrated substantial resistance to carbapenems, aminoglycosides and fluoroquinolones. Tigecycline and colistin demonstrated comparatively better activity against the resistant Gram-negative isolates.

Conclusion: The study demonstrates a considerable burden of CLABSI and highlights the predominance of S. aureus alongside highly resistant Gram-negative pathogens in the ICU

setting. The observed antimicrobial resistance, including carbapenem resistance, emphasises the need for continuous microbiological surveillance, strict central-line insertion and maintenance practices, adherence to device-care bundles, and targeted antimicrobial stewardship. Integrating routine resistance surveillance with effective infection-prevention strategies may contribute to reducing CLABSI-associated morbidity and limiting the further emergence of antimicrobial resistance.

Keywords: CLABSI; central venous catheter; healthcare-associated infection; antimicrobial resistance; Staphylococcus aureus; Klebsiella pneumoniae; carbapenem resistance; intensive care unit.

ICOH 050

Oil meets antifungal: A new front in the fight against antimicrobial resistance

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The dermatophytes are a group of fungi that infect keratinized tissue such as hair, nails, epidermis, horns and feathers. They cause superficial mycosis, also known as dermatophytosis. The global burden of dermatophyte infections is estimated to be 20–25%. In India, the prevalence of dermatophytosis could be 36.6-78.4%. Direct contact with other people, animals, or soil can result in the transmission of an infection. Although dermatophytes typically do not enter deeper tissue, they can be persistent. One of the various therapy choices for dermatophyte infections is antifungal medicine. Most dermatophyte infections are treated with the allylamine terbinafine. This is suggested as the first-line oral medication for the therapy. This drug alters the major membrane sterol of fungi, ergosterol, which inhibits the squalene epoxidase enzyme and inhibits fungus development. Fluconazole and itraconazole are the two well-established antifungal agents belonging to azoles are effective in treating this condition. Due to the increased usage of antifungal agents in recent years, resistance to antifungal medications has developed. If infections are not adequately treated, they might become chronic illnesses, necessitating the use of oral antifungal drugs, which include side effects such as hepatotoxicity. Determining therapeutic alternatives that are mostly crafted from natural products, such as bioactive chemicals obtained from plants, essential oils, and their component parts, is crucial. In the present study 30 isolates of Trichophyton mentagrophytes were used. Lethal concentration and sub-lethal concentration of the antifungal agents and oils was determined. Antifungal susceptibility testing by the microbroth dilution method was done to determine the combinatorial effect of essential oils with antifungal drugs. The susceptibility to antifungal agents changed in the presence of essential oils. While some oils increased resistance, others increased susceptibility. The presence of efflux pumps

was screened, expression study was done with different combinations of oil and antifungal agents. A downregulation in the efflux pump was observed in the presence of essential oil of lemon grass and clove indicating that these may be used to increase drug susceptibility.

Keywords: antifungal, AMR, carrier oils, dermatophytes, essential oils

ICOH 051

Surviving the stress: PA2826-Associated Redox Adaptation in Antibiotic-Tolerant *Pseudomonas aeruginosa* Persisters

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Antibiotic persistence is a major hidden driver of treatment failure, in which antibiotic-tolerant persister cells survive treatment and reseed infections even when genetic resistance has not evolved. This makes the persister state a critical target for understanding and preventing recurrent infections. Redox adaptation is important in these tolerant subpopulations but remains underexplored. *Pseudomonas aeruginosa* is a WHO priority pathogen associated with persistent infections, including respiratory infections in vulnerable individuals and patients with lung cancer. We focus on PA2826, a putative glutathione peroxidase involved in OspR-regulated peroxide defence, as a candidate persister-associated target. A public RNA-sequencing dataset of ciprofloxacin-treated P. aeruginosa persisters, PAO1 cultures versus untreated stationary-phase cultures, was analysed using transcriptomic profiling, pathway enrichment, interaction networks, structure prediction, and molecular docking. We identified 895 differentially expressed genes (481 upregulated and 414 downregulated) using adjusted $p<0.05$ and $|\log_2 FC|\geq 1$. KEGG enrichment and GO analysis highlighted broad metabolic remodelling. PA2826 was upregulated ($\log_2 FC=+1.48$ and adjusted $p=0.0336$), and its STRING network linked it to OspR, OxyR, glutathione metabolism and the AhpC/KatB peroxide-defence cluster, supporting a role in the core oxidative-stress response. The top-ranked AlphaFold2 model of PA2826 had a mean pLDDT of 96.7/100. Exploratory docking of small molecules against PA2826 identified candidates such as apigenin (−6.1 kcal/mol), whose top pose occupied a pocket neighbouring the catalytic region. As PA2826 is a glutathione peroxidase, GPx-family comparisons identified conserved residues and partially overlapping structural features, alongside protein-specific differences. These findings support further study of PA2826-associated redox responses and prioritise potential ligands. Future work will compare PA2826 with human GPX proteins to identify inhibitors that target the bacteria while sparing human cells. Experimental validation is required to establish PA2826 inhibition. Selectively targeting persister redox defences could limit recurrent infection without harming the host, a central One Health goal.

Keywords: Antibiotic persistence; Pseudomonas aeruginosa; redox adaptation; glutathione peroxidase (PA2826); oxidative stress response

ICOH 052

From Green Synthesis to Virulence Suppression: Ajwain-Derived Silver Nanoparticles as Promising Anti-Biofilm Agents

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The escalating challenge of biofilm-associated infections necessitates innovative antimicrobial strategies that extend beyond conventional bacterial growth inhibition. This study explores the potential of phytofabricated silver nanoparticles (Tm-AgNPs) synthesized using Trachyspermum ammi (Ajwain) leaf extract through a sunlight-mediated, eco-friendly approach. Plant-derived phytochemicals facilitated nanoparticle formation, capping, and stabilization, offering a cost-effective alternative to conventional synthesis methods. Comprehensive characterization revealed a surface plasmon resonance peak at approximately 480 nm, characteristic FTIR spectral shifts indicating phytochemical interactions, and XRD-confirmed crystalline silver structures. Electron microscopy demonstrated predominantly spherical nanoparticles, with sizes ranging from 40–136 nm by SEM and an average size of approximately 25 nm by TEM.

The synthesized Tm-AgNPs exhibited promising antibacterial activity against Pseudomonas aeruginosa PAO1 and *Chromobacterium violaceum* 12472, with a minimum inhibitory concentration (MIC) of 25 µg/mL against both organisms. Notably, their potential extended beyond growth inhibition: sub-inhibitory concentrations effectively attenuated quorum-sensing-associated violacein production in C. violaceum and reduced swarming motility in *P. aeruginosa*. Most significantly, Tm-AgNPs demonstrated concentration-dependent antibiofilm activity against P. aeruginosa PAO1, achieving 68.79%, 89.36%, and 96.82% biofilm inhibition at 6, 9, and 12 µg/mL, respectively. These findings highlight the potential of plant-mediated silver nanotechnology to target bacterial communication, motility, and biofilm establishment—key processes associated with microbial persistence and virulence. This study establishes Ajwain-derived silver nanoparticles as promising candidates for further investigation in anti-virulence and antibiofilm applications, warranting additional validation of their safety, selectivity, and therapeutic efficacy.

Keywords: Trachyspermum ammi, quorum sensing inhibition, antibiofilm activity, Pseudomonas aeruginosa, anti-virulence strategy.

ICOH 053

In Vitro Evaluation of the Susceptibility of Staphylococcus aureus Isolates to Ceftaroline and Other Antibiotics in a Tertiary Care Centre, Western India

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Introduction*:* *Staphylococcus aureus* is a major hospital and community pathogen, and methicillin-resistant *S. aureus* (MRSA), with an Indian prevalence of 25–50%, limits therapeutic options. Rising glycopeptide MICs have renewed interest in ceftaroline, a fifth-generation cephalosporin that binds PBP2a. Indian susceptibility data remain limited.

Aim: To evaluate the in vitro susceptibility of *S. aureus* isolates to ceftaroline and other commonly used antimicrobial agents.

Methods: A laboratory-based cross-sectional study was conducted on 86 clinical S. aureus isolates over six months (December 2025 to May 2026) in the Microbiology Department of a tertiary care hospital. Isolates were identified by conventional methods and VITEK 2. Susceptibility was tested by Kirby–Bauer disk diffusion and interpreted per CLSI M100; methicillin resistance was detected with cefoxitin (30 µg) and inducible clindamycin resistance by D-test. Ceftaroline MICs were determined by gradient strip, and VITEK 2 (AST-P628) results were compared with disk diffusion. Data were analysed using descriptive statistics (frequencies, percentages, MIC50/MIC90); resistance in MRSA and MSSA was compared using Fisher's exact test, with $p<0.05$ considered significant.

Results: Of 86 isolates tested with cefoxitin, 60 (78.9%) were MRSA. Resistance was highest to penicillin (96.1%), fluoroquinolones (87–90%), azithromycin (67.1%) and erythromycin (55.3%), then clindamycin (43.4%) and gentamicin (24.4%). Inducible clindamycin resistance was seen in 39.5% and high-level mupirocin resistance in 5.3%. Apart from penicillin, resistance did not differ significantly between MRSA and MSSA. All isolates were susceptible to ceftaroline, linezolid, rifampicin, tigecycline and vancomycin. Ceftaroline MIC50/MIC90 were 0.25/0.5 µg/mL for MRSA and 0.19/0.25 µg/mL for MSSA (range 0.064–0.75 µg/mL). Disk diffusion and VITEK 2 showed 91.9% overall categorical agreement and 86.8% agreement for MRSA detection.

Conclusion: MRSA was highly prevalent, with frequent resistance to fluoroquinolones and macrolides. Ceftaroline showed uniform in vitro activity against MRSA and MSSA (MICs well below the breakpoint), supporting its role as an alternative to glycopeptides.

Keywords: Staphylococcus aureus, Ceftaroline, Antimicrobial susceptibility testing, Methicillin-resistant Staphylococcus aureus (MRSA), Minimum inhibitory concentration (MIC).

ICOH 054

Microbiological Profile, Antimicrobial Resistance Pattern, and Clinical Outcome in Neonatal Sepsis: A Prospective Study

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Background: Neonatal sepsis remains a major cause of morbidity and mortality worldwide, particularly in resource-constrained healthcare settings. The changing microbiological profile and increasing antimicrobial resistance pose significant challenges to effective treatment. This study aimed to determine the microbiological profile, antimicrobial resistance patterns, and clinical outcomes in neonatal sepsis at a tertiary care hospital.

Methods: A prospective laboratory-based study was conducted over one year at a tertiary care hospital. Blood cultures from 695 neonates with suspected sepsis were processed using an automated blood culture system. Organism identification and antimicrobial susceptibility testing were performed using conventional microbiological methods and the VITEK 2 Compact system. Clinical outcomes and neonatal intensive care unit (NICU) stay were documented.

Results: Among 695 suspected neonatal sepsis cases, 91 (13.09%) were blood culture-positive. Gram-negative bacilli predominated (81/91; 89.01%), followed by Gram-positive cocci (8/91; 8.79%) and Candida spp. (2/91; 2.20%). Among the 60 Enterobacterales isolates, Klebsiella pneumoniae was predominant (35; 58.33%), followed by Serratia marcescens (10; 16.67%), Enterobacter spp. (8; 13.33%) and Escherichia coli (7; 11.67%). Antimicrobial susceptibility testing showed the highest susceptibility to tigecycline (56/60; 93.33%), followed by fosfomycin (53/60; 88.33%) and trimethoprim/sulfamethoxazole (47/60; 78.33%). The highest resistance was observed to cefuroxime and cefuroxime/axetil (47/60; 78.33% each), followed by amoxicillin/clavulanic acid (39/60; 65.00%) and ceftriaxone (38/60; 63.33%). Colistin was categorised as intermediate in 48 isolates (80.00%) and resistant in 12 (20.00%). Among 60 neonates with documented clinical outcomes, 37 (61.67%) were discharged in healthy condition, 12 (20.00%) died, and 11 (18.33%) were discharged against medical advice. The most frequent NICU stay was 11–15 days (15/60; 25.00%), followed by 21–25 days (13/60; 21.67%).

Conclusion: Enterobacterales, particularly Klebsiella pneumoniae, predominate in neonatal sepsis and exhibit significant multidrug resistance. Continuous AMR surveillance and

strengthened antibiotic stewardship are crucial to improve neonatal outcomes through timely diagnosis and appropriate targeted therapy.

Keywords: Neonatal sepsis; Enterobacterales; Antimicrobial resistance; Klebsiella pneumoniae; Clinical outcomes.

ICOH 055

Burden And Antimicrobial Susceptibility Profile of ESKAPE pathogens in Bloodstream Infections

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Background: Antimicrobial resistance (AMR) among ESKAPE pathogens is an escalating threat, particularly in bloodstream infections where therapeutic options are often limited and delays in effective treatment can be fatal. Understanding institution-specific resistance patterns is essential for guiding empirical therapy, antimicrobial stewardship, and infection-prevention strategies. This study assessed the distribution and antimicrobial resistance patterns of ESKAPE pathogens causing bloodstream infections in a tertiary-care hospital in South India.

Methods: A retrospective observational study was conducted using laboratory records and hospital information system data from January 2023 to December 2025 at a tertiary-care hospital in Mysuru, South India. Blood culture isolates were identified using the VITEK 2 Compact system, and antimicrobial susceptibility testing was interpreted according to Clinical and Laboratory Standards Institute criteria. The distribution of ESKAPE pathogens, antimicrobial resistance phenotypes, hospital location, and in-hospital outcomes were analysed.

Results: Of 1,796 pathogens recovered from suspected bloodstream infections, 353 (19.7%) were ESKAPE pathogens. Staphylococcus aureus was the predominant isolate (30.6%), followed by *Acinetobacter baumannii* (26.9%) and *Pseudomonas aeruginosa* (22.4%). Intensive care units accounted for 25.8% of ESKAPE infections. Multidrug resistance was identified in 24.6% of isolates, while 40.7% of S. aureus isolates were methicillin-resistant. Alarmingly high meropenem resistance was observed among *A. baumannii* (73.7%) and Klebsiella pneumoniae (56.1%). Overall, 38.8% of isolates demonstrated multidrug or clinically important antimicrobial resistance. The clinical impact was substantial, with an in-hospital mortality of 30.0% (106/353).

Conclusion: This retrospective analysis demonstrates a substantial burden of antimicrobial resistance among ESKAPE bloodstream pathogens, with particularly concerning carbapenem resistance in key Gram-negative pathogens and a high prevalence of methicillin resistance

among *S. aureus.* The concentration of infections in critical-care settings and associated mortality further emphasizes the clinical consequences of AMR. Continuous local resistance surveillance, rapid microbiological diagnosis, susceptibility-guided therapy, antimicrobial stewardship, and targeted infection-prevention interventions are urgently required. Institution-specific AMR data should be translated into evidence-based empirical treatment protocols to preserve antimicrobial efficacy and improve outcomes in patients with bloodstream infections.

Keywords: ESKAPE pathogens; bloodstream infections; antimicrobial resistance; multidrug resistance; clinical outcomes

PROJECT One Health™

Theme 3

Environmental Health, Climate Change, Food Safety & Ecosystems

ICOH 056

Soil Organic Carbon Fertility Classes under Organic Farming across Indian States: A Nationwide PRISMA-Based Assessment

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Soil organic carbon (SOC) is an important indicator of soil quality and agricultural sustainability. However, information on SOC concentrations in organically managed agricultural soils varies across Indian states. This study assessed the available evidence on SOC concentrations and their distribution across fertility classes using a systematic review following the PRISMA 2020 framework. A total of 168 SOC records from 28 Indian states and 3 Union Territories were compiled from peer-reviewed literature retrieved through Scopus and Google Scholar. SOC concentrations were classified as low (<0.50%), medium (0.50-0.75%) and high (>0.75%). Descriptive statistics were used to examine SOC concentrations, state-level classifications and regional variation. SOC concentrations ranged from 0.10% to 2.30%, with a mean of 0.77% and a median of 0.67%. Of the compiled records, 40.5% fell within the high-SOC class, 39.3% within the medium class and 20.2% within the low class. Fourteen states were classified as high-SOC, fourteen as medium-SOC, and Rajasthan as the only low-SOC state. Manipur and Puducherry were excluded from this classification because only SOC stock values were available for these regions, which were not directly comparable with SOC concentration-based classification. The North-Eastern region had the highest mean SOC concentration (1.07%), while the Indo-Gangetic Plains had the lowest (0.57%). A sensitivity analysis restricted to observations from the 0-15 cm soil depth did not change the state-level classifications. The findings summarise the available evidence on SOC concentrations in organically managed soils across India and identify differences among states and regions. The results provide a reference for comparing reported SOC concentrations and identifying areas where further soil sampling and monitoring may be needed. Differences in sampling depth, study coverage and data availability should be considered when interpreting the classifications and their implications for soil management. This study findings provide a baseline for understanding SOC fertility classes under organic farming across Indian states. Further field-based assessments using standardised sampling methods are needed to validate these patterns and support region-specific soil management.

Keywords: Soil organic carbon; Organic farming; Soil fertility class; Indian states; PRISMA 2020; Secondary-data synthesis

ICOH 057

The Impact of Ambient Heat Waves on Acute Coronary Syndrome and Stroke Admissions: A Retrospective Analysis of Cardiovascular and Respiratory Burden in Tashkent, Uzbekistan

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Background: Global climate change is precipitating an increase in the frequency and intensity of extreme weather events, establishing ambient heat waves as a critical determinant of cardiovascular, cerebrovascular, and respiratory morbidity. In Central Asia, a region characterized by a sharply continental climate and rapid urban expansion, the nexus between environmental thermal stressors and acute hospital admissions remain underexplored.

Objective: This study quantifies the impact of ambient heat waves on hospital admissions for Acute Coronary Syndrome (ACS), stroke, and acute respiratory exacerbations in Tashkent, Uzbekistan, utilizing a retrospective analysis of local meteorological data and emergency department logs.

Methods: A 3-year multi-center retrospective time-series study (2023–2025) was conducted across tertiary academic hospitals. Heat waves were defined as ≥3 consecutive days with daily maximum temperature exceeding the monthly 90th percentile (1993–2022 baseline). Emergency admissions for ACS (ICD-10 I20.0, I21, I22) and acute stroke (I61, I63) were linked to synoptic weather and pollution data. Distributed lag non-linear models with quasi-Poisson regression estimated RRs (Lag 0–7), adjusting for seasonality, day of week, humidity, PM2.5, and O3.

Results: Across 1,096 days, 42 heatwave days were identified among 14,320 acute admissions (7,840 ACS; 6,480 stroke). Heatwave exposure significantly increased acute admissions over Lag 0–2: cumulative RR was 1.28 (95% CI: 1.14–1.43) for ACS and 1.35 (95% CI: 1.19–1.52) for stroke. Coronary risk peaked immediately on Lag 0 (RR = 1.32, 95% CI: 1.18–1.48; STEMI RR = 1.34), decaying by Lag 3. Stroke risk displayed a 24-hour latency, peaking on Lag 1 (RR = 1.39, 95% CI: 1.22–1.57), driven by ischemic stroke (RR = 1.41)

rather than intracerebral hemorrhage (RR = 1.12). Older adults (≥65 years) exhibited heightened vulnerability (ACS RR = 1.36; stroke RR = 1.44).

Conclusion: Ambient heat waves trigger acute, divergent vascular surges in Central Asia: immediate cardiac strain (Lag 0) versus delayed thrombotic stroke (Lag 1). Integrating clinical and meteorological early-warning systems, mHealth physical activity titration, and heatwave medication reviews are critical to mitigate the escalating climate-induced morbidity.

Keywords: Heat Wave, Acute Coronary Syndrome, Ischemic Stroke, Distributed Lag Non-Linear Models, Time-Series Analysis, Central Asia, One Health.

ICOH 058

Correlation between rainfall and road traffic mortality in India: 2000-2015

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Background: Road traffic injuries are a leading cause of death in India. Rainfall reduces visibility and road friction and alters travel exposure, and the monsoon produces marked rainfall variability. National evidence linking rainfall to road traffic mortality (RTM) is limited.

Objectives: To describe trends in annual rainfall and RTM in India from 2000-2015, and to determine their correlation.

Methods: This ecological time-series study used 16 years of secondary data. India Meteorological Department rainfall records were averaged to a national yearly mean, with variability expressed as coefficient of variation (CV). Yearly RTM rates (deaths per 1,00,000 population; total, male, female) were downloaded from the World Bank Data360 repository. Trends were assessed by linear regression and normality by the Shapiro-Wilk test. Association was tested using Pearson and Spearman correlation, partial correlation controlling for year, linear regression and one-year lagged correlation in IBM SPSS Statistics 22.

Results: Mean annual rainfall was 1341.9 mm (SD 106.5; range 1148.8-1514.1 mm) with a mean (CV of 63.4%). Mean RTM was 16.6 (total), 25.3 (male) and 7.2 (female) per 1,00,000 population. Rainfall showed no linear trend (p=0.789), nor did total (p=0.430) or male (p=0.100) RTM, whereas female RTM declined significantly (-0.068 per 1,00,000 per year; R^2 = 0.46; p = 0.004). Annual rainfall was not significantly correlated with total (r =0.134, p = 0.620), male (r =0.200, p =0.457) or female (r = -0.331, p = 0.211) RTM; Spearman results were similar. Findings were unchanged after controlling for year (partial r = 0.122, p = 0.265). Monsoon (June-September) rainfall was also not significantly correlated with RTM.

Conclusion: No statistically significant correlation was found between annual rainfall and RTM in India during 2000-2015. National rainfall averages alone should not drive road safety policy; state or district-level studies using monthly or seasonal rainfall, adjusted for confounders, can guide targeted interventions.

Keywords: rainfall variability, road traffic mortality, correlation, monsoon, India

ICOH 059

Did the Swachh Bharat Mission Change the Trajectory of Water, Sanitation and Hygiene Indicators in India? An Interrupted Time Series Analysis, 2000–2024

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Background: India launched the Swachh Bharat Mission (SBM) in October 2014 to eliminate open defecation and expand sanitation. Its effect on national water, sanitation and hygiene (WASH) trajectories and urban–rural equity is unclear.

Objectives: To determine whether SBM implementation produced significant changes in the level and trend of national WASH indicators and urban–rural gaps in India, 2000–2024. Methods: This study used 25 annual observations (2000–2024) from WHO/UNICEF JMP: national coverage of basic drinking water, sanitation, hygiene and open defecation (OD), plus urban–rural gaps in sanitation and hygiene. Menstrual health (2010–2024, n=15) was described only. Regression was run in IBM SPSS Statistics 22.

Results: From 2000 to 2024, water coverage rose from 79.5% to 95.7%, sanitation from 14.7% to 83.4%, hygiene from 59.3% to 75.4%, while OD fell from 73.2% to 6.7%. Pre-SBM annual change was +0.69 (water), +2.83 (sanitation), +0.66 (hygiene) and −2.85 (OD) percentage points (all $p<0.001$). After 2015, sanitation showed a level increase of 0.43 points (95% CI 0.15–0.70, $p=0.004$) and a steeper slope (+0.10/year, $p<0.001$); hygiene slope increased (+0.05/year, $p=0.001$), water slope slowed (−0.02/year, $p<0.001$), OD decline slowed (+0.18/year, $p<0.001$) without level change ($p=0.995$). The sanitation gap narrowed from 46.2 to 6.3 points (−1.63/year), with a post-SBM drop (−0.30, $p=0.008$) and unchanged slope ($p=0.662$). The hygiene gap widened from 11.0 to 26.5 points (+0.67/year), more slowly after 2015 (−0.04/year, $p=0.022$).

Conclusion: SBM coincided with significant gains in sanitation and hygiene and a narrower sanitation gap, yet OD reduction slowed and the hygiene gap kept widening. Without a control series, causal attribution is limited, hygiene-focused, rural-targeted interventions are needed.

Keywords: WASH, Swachh Bharat Mission, interrupted time series, India

ICOH 060

Bridging Ecosystems for Global Health: The Importance of the One Health Approach

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Vultures are considered keystone species because they perform a vital ecosystem service as obligate scavengers. They play a crucial role in the reduction of environmental contamination through the rapid disposal of large carcasses, potentially preventing the spread of infectious diseases such as rabies, and protecting animals, and humans' health. Additionally, this species helps to regulate facultative scavengers like free-ranging dogs (FRD). India is characterized by being one of the countries that have the highest FRD populations and incidences of dog-mediated human rabies. This situation has also coincided with the dramatic decline in the vulture population. This study uses a novel agent-based model (ABM) to evaluate the impact of vulture population decline in India in relation to the increase of dog-to-dog interactions at carcasses, that could be used as an indicator of potential rabies transmission and on dogs' carrion consumption, that could be used as an indicator of whether they are able to fulfil an equivalent ecological role as vultures in the removal of carcasses. The study's findings suggested that high vulture population density succeeded in reducing the number of dog-to-dog interactions, which could indicate a reduction in the potential rabies transmission at carcasses. Additionally, indicated that the reduction in the vulture population density was associated with an increase in the number of carcasses left uneaten, and that regardless of a high dog population density, FRD were not able to remove all carcasses from the simulation environment of the Indian rural area. The ongoing decline in the vulture population is a public health concern worldwide, so studies like this are vital for conservation strategies and policy change.

Keywords: Agent Base model, vultures, rabies

ICOH 061

Household Air Pollution Exposure During the First 1,000 Days and Respiratory Morbidity Among Young Children in India: A Systematic Review and Meta-analysis

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Background: Household air pollution (HAP) from biomass and other polluting household fuels remains an important environmental health concern in India. Exposure during the first

1,000 days may be particularly important for respiratory health, yet evidence specific to this period has not been clearly synthesized.

Methods: PubMed, Embase, Web of Science, and Scopus were searched from inception to August 2026 for studies evaluating HAP exposure during pregnancy or the first 24 months of life and respiratory morbidity among children in India. Two reviewers independently screened studies, extracted data, and assessed risk of bias using ROBINS-E. Comparable adjusted estimates were pooled using a random-effects generic inverse-variance model.

Results: Of 3,098 records identified, 45 reports underwent full-text assessment and six studies met the eligibility criteria. Exposures included biomass, wood, firewood, kerosene, and other solid cooking fuels. Reported outcomes included acute respiratory infection, acute lower respiratory infection/lower respiratory tract infection (ALRI/LRTI), upper respiratory infection, and severe RSV- and non-RSV-associated LRTI. Two studies contributed to the meta-analysis of ALRI/LRTI, yielding a pooled adjusted odds ratio of 1.71 (95% CI 1.36–2.14; I^2=22.6%). Three studies were judged at overall high risk of bias and three had some concerns.

Conclusions: HAP exposure during the first 1,000 days may increase respiratory morbidity among young children in India, particularly ALRI/LRTI. However, the evidence remains limited by the small number of eligible studies, heterogeneous exposure and outcome definitions, and risk- of-bias concerns. Further prospective studies using objective exposure measurements and clearly defined early-life exposure windows are needed.

Keywords: Household air pollution (HAP), First 1000 days, environmental health, Exposure, Young children

ICOH 062

A One Health Perspective on Safe Child-Faeces and Diaper Disposal: A Mixed-Methods Evaluation Study among Fishing Communities in Coastal South India

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Introduction: Unsafe child-faeces and diaper disposal can contaminate the environment, expose humans and animals to faecal hazards, and undermine community well-being. This study was carried out to evaluate the effect of a multi-level intervention on safe child-faeces disposal and identify key determinants, perceived hazards and community-prioritised solutions for safe diaper disposal.

Methods: A community-based embedded experimental mixed-methods study was conducted over two years across five zones of Karaikal. Independent baseline and endline surveys included 500 households each with children under five years, selected using probability proportional to size and systematic random sampling. Qualitative methods included free listing, pile sorting, key informant interviews, focus group discussions, transect walks, observations, force-field analysis and social mapping. Findings informed a multi-level intervention involving positive deviants and community stakeholders, with relevance to One Health. Quantitative data were analysed using SPSS version 25, including Chi-square/Fisher's exact tests, multivariable logistic regression and Cramer's V. Free-listing responses were analysed using Smith's Salience Index, while qualitative data underwent thematic analysis.

Results: Safe child-faeces disposal increased from 22% at baseline to 35% at endline, an absolute increase of 13 percentage points (Cramer's V = 0.20). Common unsafe practices included indiscriminate dumping (48%), disposal with general waste (45%) and open defecation (35%). No formal education was associated with higher odds of unsafe disposal (adjusted OR 5.56; 95% CI 2.33–12.94; p<0.001). Free listing identified lack of awareness as the leading perceived reason for improper diaper disposal (salience 0.38), infectious disease transmission as a key health concern (0.34), and neighbourhood conflicts as a psychosocial consequence (0.35). Community awareness programmes ranked highest among proposed solutions (0.36).

Conclusion: Multi-level, community-led interventions addressing behavioural and waste-management barriers may improve safe disposal practices. Integrating community sanitation initiatives with a One Health approach can support the protection of human, animal and environmental health in coastal communities.

Keywords: Diaper disposal, Under-5 children, Mixed-Methods, Fishing Communities, One Health Approach

ICOH 063

Beyond Plastic Waste: Exploring the Human-Street Animal-Environment Nexus Through a One Health Approach in Rural and Urban Karaikal

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Background: Plastic waste mismanagement is a growing environmental challenge with implications for community sanitation and street animal welfare. Street animals frequently congregate at waste accumulation points, creating potential public health concerns. The One Health approach recognises the interdependence of human, animal, and environmental

health.

Objective: To assess plastic waste disposal practices, street animal presence near waste accumulation points, and community awareness of environmental sanitation in rural and urban Karaikal.

Methods: A mixed-methods cross-sectional study was designed among 196 community residents from selected rural and urban areas of Karaikal, Puducherry Union Territory Quantitative data were to be collected using a structured questionnaire on plastic waste disposal, household waste segregation, street animal presence, and environmental health awareness. Qualitative data were to be obtained through focus group discussions (FGDs). Structured field observations were to document visible plastic waste, street animal presence, and sanitation conditions at selected public locations. Quantitative data were to be summarised as frequencies and percentages, and qualitative data analysed thematically.

Results: Improper plastic waste disposal was reported by 57.1% of respondents, frequent street animal presence near waste accumulation points by 64.3%, and inadequate household waste segregation by 52.6%. Awareness of the link between plastic waste and animal health was reported by 42.9%, and 31.1% participated in community cleanliness activities. Illustrative FGD themes included improper waste disposal, animal congregation around waste, variable environmental health awareness, and the need for coordinated community action.

Conclusion: These simulated findings demonstrate how waste disposal practices, street animal presence, and environmental health awareness can be examined together through a One Health lens. Improved waste segregation, effective waste collection, and collaboration among residents, local authorities, and animal welfare stakeholders may support healthier, cleaner rural and urban environments.

Keywords: One Health; plastic waste; street animals; environmental sanitation; waste segregation; community awareness

ICOH 064

Beyond detection- microplastics in human body fluids

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As plastic pollution continues to intensify worldwide, microplastics, generally defined as plastic particles smaller than 5 mm, have emerged as pervasive environmental contaminants with increasing implications for human health. These particles originate from the degradation of larger plastic materials or from intentional production for specific industrial and consumer applications. With the increasing production and persistence of plastic materials, microplastics have become widely distributed across environmental and biological systems.

They have been detected in food, drinking water, air, soil, aquatic ecosystems, and human biological samples, indicating diverse routes of human exposure and highlighting the need to understand their potential effects on biological processes and human health.

Following ingestion or inhalation, smaller microplastics may cross gastrointestinal and respiratory epithelial barriers through paracellular and transcellular pathways, potentially entering systemic circulation and reaching tissues and biological fluids, as suggested by their detection in blood, urine, semen, breast milk, saliva, and respiratory specimens, although their translocation and persistence remain incompletely characterized. Within these fluids, microplastics interact with proteins, lipids, and other biomolecules to form a protein corona that may influence their surface properties, stability, cellular uptake, and tissue distribution, while associated chemicals may disrupt hormone synthesis, transport, receptor signaling, and metabolism, potentially contributing to hormonal imbalance. Effective mitigation of microplastic exposure requires the development and adoption of sustainable, biodegradable, and innovative alternatives to conventional plastics. Bio-based and biodegradable polymers, such as polylactic acid (PLA), polyhydroxyalkanoates (PHA), cellulose, and starch offer promising opportunities to reduce dependence on persistent plastics. Further approaches include seaweed- and algae-derived bioplastics, agricultural waste-derived polymers, and protein-based biomaterials, which may support the development of environmentally sustainable packaging and other plastic alternatives.

Keywords: Microplastics, human body fluids, human exposure, biological fluids, biodegradable.

ICOH 065

SAFE-ĀHĀRA 360: A Human-Centred One Health Approach to Food Safety and Security

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Introduction: Food is not truly secure simply because it is available. It should also be safe to eat, nutritious, appropriate for the consumer, and produced without harming the environment. Today, problems such as adulteration, contamination, unsafe storage, excessive processing, food wastage and poor dietary awareness continue to affect communities. Ayurveda has traditionally viewed food as an important part of maintaining health, considering its quality, source, season, preparation, quantity and suitability. Building on this perspective, the present study proposes SAFE-ĀHĀRA 360, an integrated approach connecting Ayurvedic food wisdom with modern One Health principles.

Methods: A three-stage framework was designed. First, Food Fingerprinting assesses selected physicochemical characteristics, common adulteration indicators and basic microbial safety, along with information on food source, processing and storage. Second, Āhāra Suitability Mapping evaluates the food under five domains: safety, nutritional quality, seasonal and local suitability, degree of processing, and environmental sustainability. These parameters are combined through a predefined scoring matrix to generate a SAFE-ĀHĀRA Score (0–100). Third, a Smart Food Passport uses QR-based information to provide consumers and food handlers with details on source, safety concerns, storage guidance, seasonal suitability and ways to reduce wastage.

Results: The proposed framework brings different aspects of food assessment into one simple and understandable system. Instead of giving people general advice, it can help identify specific risks and support better food choices at household and community levels. It also creates an opportunity to connect consumers, food vendors and health workers through a common information platform.

Discussion and Conclusion: SAFE-ĀHĀRA 360 moves beyond the idea that food safety means only “absence of contamination.” It presents food as something that should be safe, nourishing, suitable and sustainable. By bringing together Ayurveda, modern food-safety assessment and digital technology, this model offers a practical direction for strengthening food safety awareness and community food security within a One Health framework.

Keywords: Food Safety, One Health, Ayurveda, Food Security, Digital Food Traceability

ICOH 066

Sewage Treatment Infrastructure and River Water Quality Along the Ganga Main Stem in Uttar Pradesh: A Secondary Data Analysis

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Background: Sewage discharge is an important concern for the water quality of the Ganga River. This study assessed sewage-treatment infrastructure and river water quality across selected districts in Uttar Pradesh.

Objectives: To assess sewage-treatment infrastructure and river water quality along the Ganga main stem in Uttar Pradesh and explore their association.

Methods: A ecological analysis of secondary data was conducted across 10 selected districts. Sewage-generation and sewage-treatment data were obtained from the Uttar Pradesh Jal Jeevan Mission dataset, and water-quality data were obtained from river-monitoring records.

STP adequacy was calculated relative to estimated sewage generation. Faecal coliform (FC), biochemical oxygen demand (BOD) and total coliform (TC) were summarized using district-level medians. FC levels were compared with the CPCB maximum permissible bathing-water criterion. Spearman rank correlation was used to explore associations between STP indicators and water-quality parameters.

Results: Median STP adequacy was 85.75%, while the median FC, BOD and TC concentrations were 2,312.5 MPN/100 mL, 3.28 mg/L and 4,762.5 MPN/100 mL, respectively. Two districts (20%) exceeded the CPCB maximum permissible FC limit. Seven districts (70%) had BOD levels above 3 mg/L. FC was highest in Fatehpur (4,550 MPN/100 mL) and lowest in Hapur (645 MPN/100 mL). No significant association was observed between STP adequacy and FC (ρ=0.018, p=0.960).

Conclusion: Sewage-treatment infrastructure and water-quality indicators varied across the selected districts. However, these findings should be interpreted cautiously because of the small number of district-level observations and incomplete reporting of water-quality parameters, which may have reduced the ability to detect an association. Continued water-quality monitoring, complete reporting and improved utilization of sewage-treatment infrastructure are important for effective management of faecal contamination in the Ganga main stem.

Keywords: Ganga River; Sewage Treatment Plants; River Water Quality; Faecal Coliform; BOD.

ICOH 067

Household Environmental Conditions and Cardiometabolic Health among Women in India: Insights from NFHS-5

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Background: Household environmental exposures are associated with health outcomes. Understanding their patterns across urban and rural settings and their links with cardiometabolic health.

Objectives: (1) To examine the association between selected household environmental factors and cardiometabolic health among non-pregnant women aged 15–49 years in India. (2) To compare urban–rural differences in household environmental conditions and cardiometabolic outcomes.

Methods: A secondary cross-sectional analysis was conducted using women's and household datasets from the National Family Health Survey-5 (NFHS-5), India, 2019–2021. Of 724,110 women aged 15–49 years, 28,408 pregnant women were excluded, so the final sample was 695,702 non-pregnant women. Household exposures included cooking fuel, drinking-water availability, sanitation, housing materials, household crowding, and kitchen ventilation. Primary outcomes were hypertension and random blood glucose categories; secondary outcomes were BMI categories and central obesity. Survey weighted descriptive statistics, cross-tabulations, chi-square tests, and multivariable logistic regression were used.

Results: Overall, hypertension prevalence was 10.0%, self-reported diabetes prevalence was 1.9%, BMI-defined obesity prevalence was 24.0%, and central obesity prevalence was 40.5%. Random blood glucose was normal in 91.9% of women, while 4.7% had levels of 140–160 mg/dL and 3.4% had levels above 160 mg/dL. Clean-fuel use was substantially higher in urban than rural households (89.6% vs 42.1%), whereas unimproved sanitation was more common in rural households (27.7% vs 8.9%). Urban women had a higher prevalence of hypertension (10.9% vs 9.6%), self-reported diabetes (2.7% vs 1.6%), BMI-defined obesity (33.2% vs 19.6%) and central obesity (50.5% vs 35.8%). In adjusted analyses, polluting-fuel use was associated with higher odds of hypertension, self-reported diabetes, BMI-defined obesity and central obesity, after accounting for relevant sociodemographic factors.

Conclusion: Household environmental conditions and cardiometabolic outcomes differed by residence. Considering environmental and socioeconomic conditions together may help inform public health approaches to improving women's health. The cross-sectional design precludes causal inference.

Keywords: NFHS-5; household environment; cardiometabolic health; women; urban–rural differences

ICOH 068

Development and Nutritional Evaluation of Moong Microgreen Powder Enriched Instant Rasam Premix

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The increasing demand for convenient and nutritious food products has encouraged the development of innovative ready to cook foods incorporating nutrient-rich ingredients. The present study aimed to develop instant rasam premix supplemented with moong microgreen powder at different levels and evaluate its nutritional composition. Three formulations containing 10%, 15%, and 20% moong microgreen powder were prepared and compared with

a control sample. The samples were analysed for total energy, crude protein, crude fat, total carbohydrate, crude fiber, total ash, and moisture content. The findings revealed that the incorporation of moong microgreen powder influenced the nutritional composition of instant rasam premix. With increasing supplementation levels, the crude protein, crude fiber, and total ash contents showed an increasing trend, indicating the potential of moong microgreen powder to improve selected nutritional attributes of the product. Variations were also observed in energy, fat, carbohydrate, and moisture contents among the different formulations. These findings highlight the potential of moong microgreen powder as an ingredient for developing nutritionally enriched convenience foods.The study provides a basis for further optimization of moong microgreen-enriched instant rasam premix. Future investigations focusing on sensory acceptability, storage stability, and consumer preferences may help establish the product's suitability for wider application.

Keywords: Moong microgreens, instant rasam premix, product development, nutrition composition.

ICH 069

Incorporation of Acacia nilotica Bark Powder in Cookies and Namkpara: A Study on Nutritional and Sensory Characteristics

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Acacia nilotica (Babul) is a traditionally valued plant whose bark contains bioactive compounds with potential antioxidant and antibacterial properties. The present study aimed to explore the utilization of *Acacia nilotica* bark powder in commonly consumed snack products and evaluate its influence on their nutritional composition and sensory characteristics. Cookies and namakpara were developed by incorporating bark powder at three different concentrations: T1 (2.5 g), T2 (5.0 g), and T3 (7.5 g) per 100 g of the respective product formulation. The developed products were analyzed for proximate composition to assess their nutritional characteristics. Sensory evaluation was conducted by a semi-trained panel of 10 members using a 9-point hedonic scale. The sensory attributes evaluated included color, appearance, aroma, texture, taste, and overall acceptability. The findings indicated that the incorporation of *Acacia nilotica* bark powder influenced the sensory characteristics of both cookies and namakpara. The bark powder-incorporated products demonstrated sensory acceptability, with the 2.5 g incorporation level showing comparatively better acceptance among the supplemented formulations. This suggests that incorporating bark powder at an appropriate level may offer a promising approach to developing acceptable, value-added snack products while exploring the nutritional potential of this plant-based ingredient. The

study highlights the potential of Acacia nilotica bark powder for food product development and its possible application in diversifying commonly consumed snacks. Further investigations into antioxidant activity, antibacterial properties, physicochemical characteristics, shelf life, and storage stability of the developed products would help establish their functional potential and suitability for wider food applications.

Keywords: Acacia nilotica, bark powder, cookies, namkpara, proximate composition, sensory evaluation, value-added food products

ICOH 070

Valorisation of Banana Bract as an Underutilised Agricultural By-product for the Development and Nutritional Evaluation of a Value-Added Food Product

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Banana cultivation produces large amounts of by-products, and the bract is one of the parts most often discarded after harvest. Using such parts as food ingredients is a practical way to cut agricultural waste while widening the range of nutrient-dense foods available, an approach that connects environmental sustainability with human nutrition. The present study explored the use of bracts from the Yellaki variety of banana (Musa acuminata) in kulfi, a traditional Indian frozen dessert. Kulfi was selected as the carrier because it is widely consumed but is conventionally prepared from reduced milk and sugar, which leaves scope for nutritional improvement. Banana bract has been reported to be a source of dietary fibre, calcium, vitamin C and polyphenols with antioxidant activity. Earlier studies have also described hypoglycaemic, hypolipidaemic and hepatoprotective effects, which suggests it may be useful in the dietary management of metabolic disorders. The bracts were processed into a paste and incorporated into a standard kulfi formulation. Sensory evaluation and proximate composition of the standard and bract-incorporated kulfi was analyzed and compared. The consumer acceptability of the standard and bract-incorporated kulfi was evaluated by a panel of 50 members. The bract incorporated kulfi achieved higher hedonic scores and it had higher crude fiber content and lower carbohydrate and fat content than the standard formulation. These results suggest that the banana bract may improve the nutritional value of a widely consumed dessert, while adding value to a by-product that would otherwise be agricultural waste. Such valorization contributes to food security by better exploiting the crops already cultivated and by reducing the losses in the food production chain. Further studies on shelf life, microbial safety and retention of bioactive compounds would help to establish the suitability of the product for wider adoption.

Keywords: Banana Bract, Food Security, Functional Food, Kulfi, Valorisation

ICOH 071

Lethal fungi: Animal Cases and the Danger of Poisonous Mushrooms

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Mushroom poisoning in animals is a significant yet often underrecognized concern in veterinary toxicology. Various mushroom species, particularly those from the Amanita, Cortinarius, and Galerina genera, produce powerful toxins such as amatoxins, muscarine, and psilocybin, which can lead to serious illness and death in animals. This review examines toxic mushroom species, their poisonous compounds, mechanisms of toxicity, and documented cases involving domestic and wild animals. The review includes 34 studies published between 1979 and 2020, covering 309 reported cases of mushroom poisoning—71.5% in dogs, 4.2% in cats, and 24.3% in other animals. The majority of cases occurred in North America. Of the 309 poisoned in this paper, 137 recovered, 99 died or were euthanised, and 21 had an unknown outcome. The most common toxic fungi were Amanita spp. (108/309), followed by Inocybe spp. (25/309). There isn´t a case reported of mushroom poisoning in wild animals. Many wild animals have evolved the ability to recognize harmful plants and fungi, and they make part of their diet. The number of cases of animal poisoning associated with toxic mushrooms is probably even higher than the cases that were reported. Unfortunately, many of those cases are not well reported, or the data are not available to the public. To reduce the risk of mushroom poisoning, pet owners and livestock managers should routinely check outdoor areas for toxic mushrooms, especially during wet and humid conditions that promote fungal growth. Future efforts should focus on public education campaigns to raise awareness, encourage prompt action in suspected poisoning cases, and provide more comprehensive case documentation.

Keywords: intoxication; mushroom; toxic; animals; dogs; cat; farm animal; pathology; toxicology

ICOH 072

Sensory Evaluation and Cost Analysis of Pomegranate Peel-Enriched Biscuits Developed from Fruit-Processing Waste

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The utilization of fruit-processing by-products as functional food ingredients offers an opportunity to reduce food waste while developing value-added food products. The present

study evaluated the sensory acceptability and production economics of biscuits prepared by incorporating pomegranate peel powder (PPP) as a partial replacement for refined wheat flour. Five biscuit formulations were developed: T0 (100% refined wheat flour, control), T1 (97% wheat flour + 3% PPP), T2 (95% wheat flour + 5% PPP), T3 (92.5% wheat flour + 7.5% PPP) and T4 (90% wheat flour + 10% PPP). Sensory evaluation was performed using a 9-point hedonic scale for appearance, colour, aroma, texture, taste, crispness and overall acceptability. Production cost, suggested selling price, net return and benefit-cost (B:C) ratio were estimated for each formulation. The sensory results showed that the control received the highest overall acceptability score (8.35 ± 0.15), while T3 also demonstrated high acceptability with a score of 8.18 ± 0.16. T4 showed the lowest overall acceptability (7.25 ± 0.24), particularly for taste, texture and colour. Increasing PPP incorporation was associated with a gradual reduction in production cost. Production cost decreased from ₹142/kg in T0 to ₹134/kg in T3 and ₹132/kg in T4. The estimated net return increased from ₹48/kg in T0 to ₹61/kg in T3 and ₹63/kg in T4, while the B:C ratio increased from 1.34 to 1.46 and 1.48, respectively. Based on the research, T3 containing 7.5% PPP provided a favourable balance between sensory acceptability and economic performance. The findings indicate that pomegranate peel powder has potential for incorporation into biscuits as part of a fruit-waste valorisation strategy, although the reported results require confirmation through experimental laboratory and consumer-scale validation.

Keywords: Pomegranate peel powder, biscuits, sensory evaluation, cost analysis, fruit waste

ICOH 073

India's changing disease burden: communicable to non-communicable mortality transition and its health system correlates, 2000–2019

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Background: India has undergone a rapid epidemiological transition, with non-communicable diseases (NCDs) replacing communicable, maternal, perinatal and nutritional (CMPN) conditions as the leading cause of death.

Objective: To determine the NCD, CMPN trend and correlation with premature NCD mortality with health system indicators.

Methods: An ecological time series study was conducted using World Bank Health data from www.data360.worldbank.org which is available in public domain. Cause-of-death shares were available for four benchmark years (2000, 2010, 2015, 2019); the probability of premature (30–70 years) NCD death was available annually for 2000–2019. SPSS version 30.0 analyses

comprised descriptive statistics, linear trend regression, Pearson and year-adjusted partial correlations, and multivariable regression with Durbin–Watson and VIF checks.

Results: The CMPN share fell from 46.7% to 24.2% (−22.5 percentage points) while the NCD share rose from 44.0% to 65.9% (+21.9); injuries stayed stable (9.3–10.2%). Premature NCD mortality declined by 0.122 percentage points per year (95% CI −0.175 to −0.068; $R^2 = 0.559$; $p < 0.001$). Life expectancy ($r = −0.760$), health expenditure per capita ($r = −0.687$) and out-of-pocket share ($r = 0.544$) correlated significantly with premature NCD mortality, but not after controlling for calendar year. government health expenditure positively correlated (% of GDP: partial $r = 0.762$, $p < 0.001$; % of government spending: 0.545, $p = 0.016$). The multivariable model (adjusted $R^2 = 0.618$) retained life expectancy ($B = −0.770$, $p = 0.007$); Durbin–Watson was 0.827 and VIF 24.2.

Conclusion: The rising NCD share reflects faster decline in communicable mortality rather than rising individual risk of premature NCD death. Most health-system correlations reflected shared time trends. Findings are exploratory associations, not causal, and are limited by autocorrelation and multicollinearity.

Keywords: epidemiological transition; non-communicable diseases; premature mortality; health expenditure; India; ecological study

ICH 074

From Always-On to Digital Disconnection: Implications of After-Hours Digital Work Connectivity for Occupational Well-Being

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Background: Digital communication tools have blurred the boundary between work and non-work time. Being reachable after working hours may reduce opportunities for psychological recovery and, in turn, employees' well-being at work. Evidence on this relationship is mixed, and research from the Indian context is limited.

Objectives: The study aims to assess levels of after-hours digital work connectivity, digital disconnection and occupational well-being; to examine the relationships among these variables; and to determine whether connectivity and disconnection predict occupational well-being.

Methods: A cross-sectional, correlational survey design will be used with approximately 140 university faculty (assistant professors, associate professors and heads of department) aged 30–50 years, selected through purposive sampling. The sample size was determined a priori using G*Power. After-hours digital work connectivity will be measured with the Work

Connectivity Behavior After-Hours Scale. Digital disconnection will be operationalised as psychological detachment from work and measured with the corresponding subscale of the Recovery Experience Questionnaire. Occupational well-being will be measured with the Job-related Affective Well-being Scale (JAWS). Data will be analysed using descriptive statistics, Pearson's correlation and multiple regression, controlling for demographic and work-related variables. An exploratory moderation analysis will examine whether digital disconnection attenuates the association between after-hours connectivity and well-being. **Expected results:** Higher after-hours digital work connectivity is expected to be associated with lower occupational well-being, whereas greater digital disconnection is expected to be associated with higher well-being. Both variables are expected to jointly predict well-being.

Implications: The findings are expected to provide evidence from an Indian higher-education setting and to inform institutional policies on after-hours communication, such as response-time norms and designated quiet hours.

Keywords: after-hours connectivity; digital disconnection; psychological detachment; occupational well-being

ICOH 075

Heat, Bites and Bugs: A Season-Smart One Health Model Linking Climate Change, Mosquito-Borne Diseases and Antimicrobial Resistance in India

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Background: Rising temperatures are linked to many diseases, from dengue to heart disease [1]. Malaria cases and deaths in India fell by nearly 80% between 2015 and 2025, and 160 districts reported zero indigenous malaria cases during 2022 to 2025 [2]. The monsoon and post-monsoon months remain the high-transmission season [2]. At the same time, the Government has noted that overuse and misuse of antibiotics have become common practice [3]. These three problems meet at the fever clinic.

Objective: To review how India's climate, mosquito control and antimicrobial resistance (AMR) programmes connect, and to propose a joint One Health model.

Methods: Document review of 2026 Press Information Bureau releases of the Government of India, with gap analysis.

Results: State Action Plans on Climate Change and Human Health cover all 36 States and UTs [4]. Heat Action Plans run in 23 states, with seasonal heatwave outlooks from the India Meteorological Department [5]. Mosquito control uses sentinel surveillance hospitals, apex referral laboratories and integrated vector control [6]. Dengue cases must be reported on IHIP-VBD [7]. NAP-AMR 2.0 (2025 to 2029) involves more than 20 ministries, including AYUSH [3]. However, none of the releases reviewed linked monsoon fever planning with antibiotic stewardship. We propose a Season-Smart Stewardship model: use weather outlooks to forecast fever seasons, test before treating, follow standard treatment guidelines, and track antibiotic use alongside IHIP-VBD data.

Conclusion: Every monsoon fever season is also a risk season for antibiotic misuse. Joining existing programmes at the fever clinic is a low-cost way to protect India's gains. This needs the National Vector Borne Disease Control Programme (NVBDCP), climate-health and AMR programmes to work closely with States/UTs.

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PROJECT One Health™

Theme 4

Integrating AYUSH & Traditional Systems into One Health & Therapeutics

ICOH 076

Effect of *Salvia Plebeia* on Blood Sugar, Liver Function, Lipid Profile and Oxidative Stress in Streptozotocin- Nicotinamide induced Type 2 Diabetes Mellitus (T2DM) model in Rats.

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Background: Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder marked by persistent hyperglycemia, dyslipidemia and associated multi-organ complications. Salvia plebeia flavonoids possess antioxidant and metabolic regulatory properties, indicating potential therapeutic benefits in T2DM management.

Objective: To evaluate the anti-diabetic, lipid-modulating and organ-protective effects of Salvia plebeia flavonoids (100 and 200 mg/kg) in STZ-NIC induced diabetic rats compared to Metformin.

Methods: Following IAEC and CPCSEA guidelines, T2DM was induced in Wistar rats via intraperitoneal nicotinamide (110" mg/kg") and streptozotocin (65" mg/kg"). Rats with blood glucose >250" mg/dl" on day 7 were divided into six groups (n=6): Normal Control, Diabetic Control, Salvia plebeia (100 and 200" mg/kg"), Metformin (250" mg/kg") and a combination group, treated orally for 28 days. Fasting blood glucose, LFTs, lipid profiles, RFTs, oxidative stress and inflammatory markers were assessed. Data were analyzed using one-way ANOVA with post-hoc tests (mean ± SD, $p<0.05$).

Results: Salvia plebeia treatment significantly and dose-dependently attenuated fasting blood glucose from diabetic control levels (278±15" mg/dl") to near-normal values by day 28 (SP 100: 138±12" mg/dl" ; SP 200: 120±11" mg/dl" ; MET 250: 130±10" mg/dl" ; $p<0.05$ vs. DC). Treatment markedly ameliorated dyslipidemia, significantly lowering total cholesterol (310±20 to 140±13" mg/dl"), triglycerides (290±18 to 135±12" mg/dl") and LDL (150±15 to 120±10" mg/dl"), while elevating HDL (30±5 to 57±8" mg/dl") ($p<0.05$). Furthermore, elevated hepatic markers (ALT: 115±10 to 64±7" U/L" ; bilirubin: 0.4±0.05 to 0.1±0.02" mg/dl") and renal markers (creatinine: 0.4±0.05 to 0.1±0.01" mg/dl" ; BUN: 42±5 to 26±4" mg/dl") were significantly restored toward physiological ranges. Corresponding improvements were observed in antioxidant and inflammatory profiles. Notably, the therapeutic efficacy of the 200" mg/kg" dose was comparable to standard Metformin (250" mg/kg").

Conclusion: Salvia plebeia flavonoids exhibit prominent, dose-dependent antidiabetic, hypolipidemic and organ-protective efficacy comparable to Metformin, validating their translational potential for T2DM management.

Keywords: Type 2 Diabetes Mellitus, Non-communicable diseases, Streptozotocin-nicotinamide model, Plant-based therapeutics, Salvia plebeia

ICOH 077

Siddha Ethnoveterinary Legium Formulations In Livestock Healthcare: A Review Of Phytochemical Foundations, Pharmacological Rationale And One Health Implications

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Background: The intensification of industrial livestock production has escalated reliance on synthetic antimicrobials, contributing to global antimicrobial resistance (AMR) and the accumulation of pharmaceutical residues in human food systems. Classical Siddha ethnoveterinary literature namely Maattu Vagadam offers an empirical plant-based paradigm for animal healthcare namely Legium, a semisolid herbal formulation prescribed for primary disease prophylaxis, systemic immunomodulation through mukkutram (vatha, pitha, kapha) harmonization, and digestive enhancement.

Materials and methods: This review synthesizes classical Siddha manuscript literature namely Maattu Vagadam, botanical documentation, phytochemical profiles and electronic databases such as pubmed, google scholar, etc. Data regarding bioactive constituent profiles, herbal synergy, and jaggery-based drug delivery matrices were systematically compiled and analyzed to evaluate their therapeutic rationale in veterinary care.

Results and discussion: Phytochemical analysis demonstrates that classical Legium preparations incorporate key bioactives—including piperine, curcuminoids, and gingerols embedded within a jaggery-based bio-enhancer matrix. These compounds exert synergistic gastroprotective, carminative, antioxidant, and immunomodulatory activities. By promoting digestive stimulation and toxin clearance, Legium formulations preserve gut microflora integrity, optimize nutrient absorption, and fortify systemic mucosal immunity. The lipid-rich electuary matrix acts as a natural delivery system, enhancing lipophilic phytochemical bioavailability and bio-efficacy without reliance on synthetic additives.
Conclusion: Maattu Vagadam Legium formulation represents a scientifically rational, residue-free phytotherapeutic framework for preventative veterinary medicine. Integrating these classical Siddha formulations into herd health management protocols provides a sustainable,

non-antibiotic strategy to enhance livestock metabolic resilience, reduce chemical antimicrobial dependence, and advance One Health sustainability.

Keywords: Siddha medicine, Maattu vagadam, Antimicrobial resistance, One health, Ethnoveterinary.

ICOH 078

Impact of dietary inclusion of ksheerabala residue on development performance in Wistar rats

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After bala (*Sida cordifolia*), cow milk, and gingelly oil (*Sesamum indicum*) are combined to make ksheerabala oil, a by-product known as ksheerabala residue is obtained. Many farmers utilize this waste as a feed for their cattle because it is readily available in large quantities. However, nothing is known about the extent to which Ksheerabala residue is incorporated or how it affects rat growth. Therefore, the purpose of this study was to determine whether Wistar rats' performance improved after their diets included Ksheerabala residue as a feed resource. The experimental animals consisted of twenty-four male Wistar albino rats, each with a weight of 80 ± 5g. The rats were randomly assigned to one of two treatments, with each treatment having six duplicates. Two groups were used in this study; one group received a standard diet according to BIS specifications (control-T1), and the other group received a diet that contained 5% Ksheerabala residue (T2). There was no statistically significant difference between the two groups with respect to hemodynamic, biochemical, dry matter intake, average body weight, or weight gain (P>0.05). The current investigation found that rats' growth performance was unaffected by the addition of Ksheerabala residue to their diets up to a 5% level.

Keywords: Ksheerabala residue, Rat, Blood, Growth

ICOH 079

Phytochemicals' computational targeting of monkeypox virus core cysteine protease: The use of an in-silico approach

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The emergence and progression of pathogenic viruses have posed a significant challenge to modern medicine and the global economy, as well as a severe threat to human health. Nearly all of these viruses are zoonotic, indicating they were initially detected in

animals before transmitting to humans. An emerging virus may lead to a few isolated cases, resulting in a localized outbreak, or it may cause extensive infection and disseminate globally, instigating a full-scale pandemic. Such developing phenomena have manifested regularly and in many forms during the past few decades. Monkeypox is a zoonotic illness caused by the monkeypox virus, which belongs to the orthopoxvirus family, among variola, cowpox, and vaccinia. Both animals and people are susceptible to it. Resembling smallpox, however exhibiting milder rashes and a reduced fatality rate, the symptoms are markedly analogous. In July 2022, the World Health Organization designated the monkeypox outbreak a global public health emergency. Food and Drug Administration has currently approved tecovirimat, cidofovir, and brincidofovir for the treatment of the monkeypox virus. However, these synthetic medications may produce some negative effects. Scientists are developing natural therapies as alternatives to these pharmaceuticals. This study employed virtual screening of phytochemicals (N-(2-Allylcarbamoyl-4-chloro-phenyl)-3,4-dimethoxy-benzamide, 6-Dimethylaminonaphthene-1-sulfonic acid amide, Oleic Acid, and dipentyl ester) derived from Allophylus serratus against the core viral cysteine proteases of the monkeypox virus. The docking investigation demonstrated that the chosen ligands interact with the target viral protein, exhibiting binding affinities between -5.0 and -6.7 kcal/mol. N-(2-Allylcarbamoyl-4-chloro-phenyl)-3,4-dimethoxy-benzamide had the highest binding affinity of -6.7 kcal/mol, warranting additional investigation for the design of new therapeutics against the monkeypox virus. This work anticipates that bioactive phytochemicals may serve as template molecules for subsequent experimental assessment of their efficacy against the monkeypox virus.

Keywords: Monkeypox, Tecovirimat, Docking study, Drugs, Cysteine proteases

PROJECT One Health™

Theme 5

Occupational Health, Workplace Hazards, and Burnout Among Professionals

ICOH 080

Occupational Mental Health at the Human–Animal–Environment Interface: A Systematic Review within the One Health Framework

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Background: Occupational mental health is influenced not only by workplace conditions but also by environmental, climate-related and animal-associated exposures. Healthcare workers, agricultural workers, veterinarians, animal handlers, sanitation workers and outdoor workers may experience overlapping physical and psychosocial hazards. This systematic review aimed to synthesize evidence on occupational, environmental, climate-related and animal-interface determinants of mental health within a One Health framework. **Methods:** A systematic review was conducted using the PRISMA 2020 framework. PubMed/MEDLINE, Scopus, Web of Science, Embase, PsycINFO, CINAHL and Cochrane Library were considered for studies published between 2000 and 2026. Studies involving working-age adults and reporting occupational exposures with mental-health outcomes, including depression, anxiety, occupational stress, burnout, psychological distress and post-traumatic stress disorder, were eligible. Two reviewers independently screened studies, extracted data and assessed methodological quality. Random-effects meta-analysis was planned where sufficient homogeneity was present.

Results: Approximately 2,400 records were identified, of which around 600 duplicates were removed. Following title/abstract screening and full-text assessment, approximately 72 studies meet the inclusion criteria, with about 38 studies considered suitable for quantitative synthesis. Healthcare workers represented approximately 36% of included studies, followed by agricultural workers (22%), veterinary/animal-related workers (13%), sanitation workers (10%) and construction/industrial workers (11%). Occupational stress was the most frequently assessed outcome, followed by burnout, anxiety and depression. Pooled estimates suggested approximately 53% occupational stress, 41% burnout, 38% anxiety, 34% depression and 39% psychological distress. High workload, long working hours, low job control and workplace violence were frequently reported psychosocial hazards. Climate-related exposures, particularly heat and drought, and animal-interface risks were emerging determinants of psychological distress.

Conclusion: A substantial burden of adverse mental-health outcomes among diverse occupational groups and indicate that psychosocial, environmental, climate and animal-associated exposures may interact to influence worker mental health. A One Health approach integrating occupational health, environmental monitoring, animal health and mental-health services may provide a more comprehensive prevention strategy. Further longitudinal and

intervention studies are required, particularly among vulnerable workers in low- and middle-income countries.

Keywords: One Health, occupational health, mental health, burnout, occupational stress, climate change

ICOH 081

Comparative analysis of sleep quality, sympathetic cardiovascular reactivity and anxiety in night- and day-shift healthcare workers- a pilot study.

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Background: Sleep quality influences the autonomic cardiovascular regulation and psychological well-being. Healthcare workers, especially the night shift-workers may experience disruption in sleep wake pattern which may affect cardiovascular and mental health. However, the relationship between sleep quality, anxiety, and sympathetic reactivity among them remains inadequately characterized.

Objective: To compare sleep quality, cardiovascular reactivity, and anxiety between well-rested day-shift workers and sleep-deprived night-duty workers.

Methods: This cross-sectional analytical study included 70 healthcare workers, comprising 35 night-shift and 35 day-shift workers. Demographic and anthropometric characteristics were recorded, and sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). Sympathetic cardiovascular reactivity was assessed using a sustained isometric handgrip test performed at 30% of maximum voluntary contraction for 2 minutes. The maximum change in diastolic blood pressure (ΔDBP) from baseline was measured. Anxiety symptoms were assessed using the Generalized Anxiety Disorder-7 (GAD-7) scale. A group × time interaction analysis was performed to determine whether the change in DBP from basal state to isometric handgrip differed between the two groups. Between-group differences in sleep quality index and GAD were assessed using appropriate statistical test.

Results: Both the groups were comparable with respect to age, BMI, sex, and occupational distribution. Sleep quality was significantly poorer among night-shift workers, with higher PSQI scores (8.0 [IQR 2.0] vs. 4.0 [IQR 2.0]; $p < 0.001$). Anxiety scores were also significantly higher among night-shift workers (14.0 [IQR 4.5] vs. 4.0 [IQR 2.0]; $p < 0.001$). The group × time interaction for DBP was statistically significant ($F(1,68) = 184.94$, $p < 0.001$), indicating a significantly greater increase in DBP during isometric handgrip among sleep-deprived/night-duty workers.

Conclusion: Night-shift healthcare workers demonstrated poorer sleep quality, increased cardiovascular reactivity to isometric stress, and higher anxiety scores. Therefore, strategies addressing sleep health and cardiovascular risk in night-duty workers may be warranted.

Keywords: Night-shift; Isometric Handgrip; Anxiety; Pittsburgh Sleep Quality Index; GAD-7

ICOH 082

Night-shift work and anthropometric indicators: An occupational health study of corporate professionals in Kolkata

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Background: Night-shift work requires wakefulness and eating during the biological night, which may disturb sleep and dietary behaviour. With the expansion of round-the-clock corporate operations, understanding these behavioural patterns among night-shift employees is increasingly relevant to workplace health. However, evidence from Indian corporate workplaces is limited.

Aim: The study aimed to examine the association between night-shift work and anthropometric indicators among corporate professionals in Kolkata.

Methodology: A cross-sectional study was conducted with a brief education programme, from February to April 2025 among 250 full-time night-shift employees aged 18-40 years residing in Kolkata, recruited by purposive sampling with informed consent. Individuals with chronic illnesses, pregnancy or lactation, and rotating-shift schedules were excluded. A semi-structured questionnaire including the Morningness-Eveningness Questionnaire assessed sleep and eating behaviour (section-wise Cronbach's alpha 0.71-0.74). The relationship between years of night shift work and anthropometric measures was examined using Pearson's correlation. Following the baseline assessment, participants received nutrition and sleep-hygiene education through audio-visual aids and were reassessed for sleep, meal regularity and dietary behaviour.

Result and Discussion: Mean BMI was 28.08 kg/m² (obese by Asian cut-offs), mean WHR was 0.92 and mean body fat was 31.85%. Years of night shift work were positively correlated with BMI (r = 0.84), WHR (r = 0.62) and body fat percentage (r = 0.52), supporting the hypothesis, whereas no association was found with lean body mass (r = -0.05). After the

education programme, participants showed improvement in sleep, meal regularity and dietary behaviour.

Conclusion: Longer night shift exposure appeared to be associated with less favourable anthropometric indicators in this sample. Nutrition and sleep-hygiene programmes could be a useful part of workplace wellbeing initiatives for night-shift employees, and they merit evaluation in controlled studies. Further studies could also assess association with mental wellbeing to understand overall workplace health.

Keywords: Night-shift employment, Sleep behaviour, Workplace health, Anthropometric indicators, Health education.

ICOH 083

Faculty Burnout in Post-Pandemic Postgraduate Education: A Review of Antecedents, Consequences, and Intervention Strategies Among Educators Teaching Advanced Graduate Programs

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Background: The post-pandemic transformation of higher education has presented significant challenges for faculty engaged in postgraduate and advanced graduate education. Growing concerns about faculty burnout are driven by a combination of escalating academic workloads, the swift uptake of digital and hybrid teaching, the pressure of research and publication, administrative duties, the needs of student support, and the constraints of institutional resources.

Objective: This review addresses the key antecedents, consequences, and intervention strategies related to burnout in educators teaching postgraduate and advanced graduate programs in the post-pandemic era. The review considers personal, interpersonal, organisational, and systemic factors that contribute to emotional exhaustion, depersonalisation, and reduced professional efficacy. They highlight increased workloads, work–life conflict, technological demands, role ambiguity, reduced interaction with colleagues, pressure to publish, inadequate institutional support and shifting student expectations.

Expected result: The review is likely to identify important correlates of faculty burnout including high workload, role conflict, technological demands, lack of institutional support, research pressures, decreased collegial interaction, and poor work–life balance. It is also likely to highlight such effects as emotional exhaustion, reduced professional efficacy, lowered job satisfaction, impaired teaching performance, reduced research productivity and faculty turnover.

Conclusion: The issue of faculty burnout in post-pandemic postgraduate education is a multidimensional problem and needs to be addressed at both individual and institutional levels. Sustainable workload policies, supportive academic environments, effective faculty-development programs and accessible well-being initiatives may contribute to strengthening faculty resilience and improving quality and sustainability of postgraduate education.

Keywords: faculty burnout, postgraduate education, graduate teaching, occupational stress, intervention strategies

ICOH 084

Exploratory study on experiences of needlestick injuries among housekeeping staff and Biomedical waste handling practices in a tertiary care Hospital.

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Needlestick injuries are among the most common occupational health hazards for healthcare workers. Globally, more than 3 million healthcare workers are exposed to needlestick injuries. Needlestick injuries are a source of transmission of infections like HIV, HBV, and HCV. Housekeeping staff are always at risk of getting NSI while handling waste. This exploratory study examines the experiences of needlestick injuries among housekeeping staff in a multi-speciality hospital. A qualitative study was conducted among 25 housekeeping staff who handle biomedical waste. A semi-structured questionnaire was used to collect the data through the individual interview method. A thematic approach was used to identify themes and coded it using a defined process. The study highlighted the factors contributing to needlestick injuries and challenges faced by housekeeping staff during the process of biomedical waste handling. Furthermore, it assessed the relationship between the occurrence of needlestick injuries and biomedical waste handling practices. Based on the findings, the study aims to propose recommendations for improving safe biomedical waste handling practices and preventing needlestick injuries among housekeeping staff. Based on the findings, recommendations were made to enhance the safety of housekeeping staff and safety-engineered devices. Furthermore, it assesses the relationship between the occurrence of needlestick injuries and biomedical waste handling practices. Based on the findings, the study aims to propose recommendations for improving safe biomedical waste handling practices and preventing needlestick injuries among housekeeping staff.

Keywords: Biomedical Waste Management, Needlestick injuries, Housekeeping staff, Experiences, Challenges

ICOH 085

Impact of work life challenges on women's mental health:A Social work Study.

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A Work-life imbalance significantly disturb women's physical and mental health. It can by causing chronic stress, fatigue, and burnout due to the dual burden of professional duties and household responsibilities, kids responsibilities. Women are facing major life challenges like a time limitation. A women can facing challenges during long working hours, rigid deadlines, and heavy workloads leave women with little to no time for rest, personal care, or social engagement. She have dual Burden of traditional cultural expectations mean women often bear the primary responsibility for childcare, eldercare, and household chores alongside their careers. Women also have Workplace Pressure. She have high performance expectations from managers, lack of workplace flexibility, and occasional discriminatory behaviours or lack of peer support add to daily friction. These all factors are responsible for impact on her mental health. We are studying here Mental Health Strain of woman. She have chronic imbalance correlates strongly with elevated stress, anxiety, emotional exhaustion, and depressive symptoms. She have physical Exhaustion. She have continuous overwork without adequate recovery leads to sleep deprivation, chronic fatigue, headaches, and lowered immune function. She reduced Quality of Life. She facing constant pressure to excel in both domestic and professional spheres diminishes overall well-being, life satisfaction, and personal happiness .In given research study researcher want to do quantitative research study on women's mental health. Researcher will be conduct interview schedule to communicate with working women. Researcher collect information near about from 100 women. Researcher have to analyse the data by using chi square test. Researcher find out impact of mental health and work life challenges by using this research study.

Keywords: Women mental health, work burden, physical tiredness, work challenges, life challenges

ICOH 086

Occupational and Mental Health: A One Health Approach to Building a Healthy and Resilient Workforce

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Background: Occupational stress, burnout, anxiety, and work-related illnesses are increasing globally, affecting employee well-being, productivity, and organizational performance. The

One Health approach recognizes that human health is closely linked to environmental, occupational, and social factors. Healthy workplaces that support both physical and mental well-being are essential for achieving sustainable health outcomes.

Objectives: To explore the importance of integrating occupational and mental health within the One Health framework and highlight strategies for promoting healthier workplaces.

Methods: A narrative review of published literature, international guidelines, and workplace health initiatives was conducted. Evidence related to occupational hazards, psychosocial risk factors, workplace stress, mental health promotion, and organizational interventions was synthesized.

Results: Occupational hazards such as excessive workload, poor work-life balance, inadequate organizational support, and unsafe working conditions significantly contribute to stress, anxiety, depression, and burnout. These mental health challenges can reduce productivity, increase absenteeism, and negatively affect overall health. Evidence suggests that comprehensive workplace interventions—including mental health awareness, stress management programs, supportive leadership, safe working environments, regular health screening, flexible work policies, and access to psychological support—improve employee well-being and organizational outcomes. Collaboration among employers, healthcare professionals, public health experts, environmental specialists, and policymakers is essential to develop healthy work environments that support both physical and mental health.

Conclusion: Occupational and mental health are integral components of the One Health framework. Promoting safe, supportive, and mentally healthy workplaces requires multidisciplinary collaboration and preventive strategies that address individual, organizational, and environmental factors. Strengthening workplace health policies and integrating mental health into occupational health programs can improve workforce resilience, reduce disease burden, and contribute to sustainable development. Further research is needed to evaluate the long-term impact of integrated workplace health interventions across diverse occupational settings.

Keywords: One Health, Occupational Health, Mental Health, Workplace Wellness, Burnout, Stress Management, Public Health.

ICOH 087

Invisible Frontliners: Quantifying the Crisis of Burnout and Medical Radiography Professional Identity

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Background: Medical radiographers and imaging technologists are essential but often under-recognised members of the healthcare workforce. They face high patient throughput, staffing shortages, shift work, radiation-safety concerns, emotionally demanding clinical encounters, and limited professional visibility. These pressures can weaken professional identity, reduce job satisfaction, and contribute to burnout, particularly during periods of system stress such as the COVID-19 pandemic.

Aim: The study aims to quantify the burden of occupational stress and burnout among radiography professionals and examine how burnout affects professional identity, quality of life, workforce retention, and patient-care quality.

Methods: The study synthesis drew on peer-reviewed studies of radiographers, radiologic technologists, radiologists, and allied imaging personnel. The included evidence comprised a scoping review of radiographer well-being, a systematised review of stress and burnout in radiological personnel, an oncology-provider study of burnout and coping, and a cross-sectional Indian survey of 153 radiologists and imaging technologists during COVID-19. Parameters included burnout prevalence, emotional exhaustion, depersonalisation, reduced personal accomplishment, compassion satisfaction, secondary traumatic stress, quality of life, workload, coping strategies, and resilience-promoting interventions.

Results: Reported burnout prevalence across radiological personnel ranged from 1.3% to 90%, reflecting differences in role, setting, instrument, and pandemic-era workload. In a meta-analysis of 43 studies, pooled emotional exhaustion was 54%, depersonalisation 52%, and low personal accomplishment 36%. Among radiographers specifically, a scoping review of 10 studies from nine countries found consistently high stress, emotional exhaustion, and depersonalisation, together with reduced quality of life. During COVID-19, most Indian radiologists and imaging technologists reported moderate burnout and secondary traumatic stress, although most also reported moderate-to-high compassion satisfaction; compassion satisfaction was negatively correlated with burnout and secondary traumatic stress. Recurrent stressors included inadequate staffing, workload, role ambiguity, radiation anxiety, and limited recognition.

Conclusion: Burnout is a substantial and under-recognised threat to the radiography workforce, undermining professional identity, well-being, and potentially care quality. Organisational interventions, safe staffing, workload management, recognition, psychological support, resilience and coping training, and workplace physical-activity programmes are needed alongside individual-level strategies. Protecting these “invisible frontliners” is essential for sustaining a resilient medical-imaging workforce.

Keywords: Burnout, Occupational stress, Quality of Life (QoL), Job satisfaction

PROJECT One Health™

Theme 6

Mental Health, Psychosocial Well-Being, and Behavioral Studies

ICOH 088

Diagnosis to Desk: Disability and Quality of Life Among Adolescent and Young adult cancer survivors

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Adolescent and young adult (AYA) cancer survivors (ages 15–39) represent a uniquely vulnerable population whose diagnosis often disrupts critical psychosocial milestones such as education, career development, and social integration. Employment, a cornerstone of identity and recovery, is frequently compromised by persistent physical and psychological sequelae of cancer and its treatment. While global research has highlighted the interplay between work disability and quality of life (QoL), this nexus remains critically understudied in India, where cultural factors such as stigma, gender roles, and reliance on familial support networks may exacerbate survivors' challenges. This study employed a cross-sectional quantitative design to examine the relationship between work disability and QoL among 198 employed AYA cancer survivors in Kerala, India. Disability was assessed using the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0), while QoL was measured with the Quality of Life – Cancer Survivor (QoL-CS) scale. Statistical analyses included correlations, t-tests, and ANOVAs to explore associations and group differences. Findings revealed that higher disability scores were significantly associated with lower overall QoL ($r = –.525$, $p < .01$), particularly impacting social well-being ($r = –.627$, $p < .01$) and increasing distress and fear. Gender comparisons indicated that female survivors reported higher QoL and social well-being but also greater distress and fear compared to males. Marital status influenced outcomes, with married survivors reporting higher QoL, while separated/divorced survivors experienced lower social well-being and higher distress. Education level also shaped experiences: postgraduate survivors reported lower disability and fear, whereas undergraduates reported the highest QoL and social well-being. These results underscore the complex interplay between disability, employment, and psychosocial outcomes in young Indian cancer survivors. The findings highlight the urgent need for culturally sensitive workplace accommodations, survivorship care, and targeted interventions to foster resilience and improve long-term well-being among this growing population.

Keywords: Adolescent and Young Adult Cancer Survivorship, Quality of Life, Work Disability, Kerala

ICOH 089

Mental health as a public health priority: district-level analysis of Karnataka (2018-22)

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Background: Globally, over 1.1 billion people approximately 15% of the world's live with a mental health disorder, it is the 5th leading causes of health loss worldwide. In India, the national burden is profound, with an estimated 10.6% of adults suffering from a current mental illness. At the state level, the National Mental Health Survey (NMHS) highlights that 8% of the population in Karnataka experiences a mental health disorder, underscoring the urgent need for the public health interventions. Objective: To assess the distribution patterns of reported mental health cases across 30 districts Karnataka (2018-22).

Methods: Secondary data were obtained from Open Government Data (OGD) Platform India and analysed using MS Excel (Version 2609). A descriptive analysis of district-wise data of 4 years (2018-22) was conducted. Reported counts were compared across 6 categories: severe mental disorder, common mental disorder, alcohol and substance abuse, cases referred to higher centres, suicide-attempt cases, and other presentations. Annual totals, composition, rankings, and trends were examined.

Results: Across the 4 financial years, Bengaluru Urban recorded the highest proportion of common mental disorders cases (51.41%), while Davanagere had the highest percent of severe mental disorder cases (32.76%), Raichur had the highest percentage of alcohol and substance abuse cases (21.51%), Hassan recorded the highest proportions of cases referred to higher centres (10.22%) and suicide-attempt cases (15.90%), whereas Bagalkote had the highest proportion of cases classified as "others" (55.09%). Reported number of cases in Davanagere and Tumkur increased from 2029 to 2022 by (22.68%) and (36.8%) respectively, suggesting improved reporting and service utilization. Conclusion: The district-level variations in service activity which underscore the need for improved service delivery, and public health planning is to be address Karnataka's 8% mental health burden.

Keywords; Mental Health, District-level Analysis, Karnataka, Mental Health Services.

ICOH 090

Impact of loud v/s mental om chanting on loneliness and resilience among elderly individuals – a randomised controlled trail

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Background: Loneliness and reduced resilience are important psychosocial concerns among older adults and may negatively affect emotional well-being and healthy ageing. Om chanting is a simple, accessible yogic practice, but evidence directly comparing loud and mental chanting in older adults remains limited.

Objective: To evaluate and compare the effects of loud and mental Om chanting on loneliness and resilience among elderly individuals.

Methods: A three-arm randomized controlled trial was conducted among 60 adults aged 50–70 years with mild to moderate depressive symptoms. Participants were randomly allocated to loud Om chanting (n=20), mental Om chanting (n=20), or supine rest (n=20). The intervention was practiced for 15 minutes, twice daily, five days per week for one month. Loneliness and resilience were assessed before and after the intervention using the Revised UCLA Loneliness Scale and Connor–Davidson Resilience Scale (CD-RISC), respectively. Within-group changes and between-group differences were analyzed using appropriate statistical tests.

Results: Loneliness scores decreased significantly within all three groups ($p<0.001$). However, post-intervention loneliness scores did not differ significantly between groups ($p=0.887$). Resilience improved significantly across all groups ($p<0.001$), with a significant difference in post-intervention scores between groups ($p<0.001$). Loud Om chanting showed the greatest improvement in resilience, followed by mental Om chanting and supine rest.

Conclusion: Both Om chanting approaches were associated with improved resilience and reduced loneliness. Loud Om chanting demonstrated a greater improvement in resilience compared with mental chanting and supine rest. Om chanting may therefore be considered a feasible, low-cost, non-pharmacological practice to support psychological well-being among older adults.

Keywords: Om chanting; elderly individuals, non- pharmacological intervention, loneliness, resilience

ICOH 091

Perceived Health Locus of Control and Wellbeing Following Cataract Surgery: Examining the Mediating Roles of Perceived Benefits and Preoperative Counselling

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Background: Cataracts are one of the leading causes of visual impairment in the world, affecting the quality of life, daily activities and mental wellbeing of individuals. It is considered a concern for public health, and is a burden primarily borne by lower-to-middle income countries, such as India.

Purpose: Cataract surgery is the primary intervention for restoring vision. However, the recovery following the surgery is not only dependent on restoration of vision but also on the patient's perceptions and preoperative experiences that shape postoperative wellbeing. The present study examined the relationship between perceived health locus of control and wellbeing using preoperative counselling and perceived benefits as mediators, post-bilateral cataract surgery.

Methodology: A cross-sectional study design was used, recruiting 121 participants who had undergone bilateral cataract surgery at a tertiary eye hospital. The World Health Organisation-Five WellBeing Index (WHO-5) and scales for perceived health locus of control, preoperative counselling, and perceived benefits were used. Data analysis was done using JAMOVI (2.7.31), and mediation analysis results were obtained through Hayes PROCESS Macro (Model 4) (version).

Results: There was no significant relationship found between perceived health locus of control and wellbeing, but there was an indirect relationship through preoperative counselling and perceived benefits using mediation analysis, showing partial parallel mediation.

Conclusion: Wellbeing influences perceived health locus of control indirectly through perceived benefits and preoperative counselling. This demonstrates the importance of psychological factors in addition to clinical outcomes in cataract surgery recovery.

Keywords: Cataract Surgery, Wellbeing, Health Locus of Control, Preoperative Counselling, Perceived Benefits

ICOH 092

Impact of Smartphone Addiction on the Mental Health of School-Going Children and Adolescents: A Post-COVID-19 Narrative Review, 2021–2025

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Jamia Hamdard

Problematic smartphone use, also known as smartphone addiction, smartphone dependence, mobile-phone addiction, or nomophobia, has emerged as an issue of development and mental-health concern in the aftermath of the COVID-19 pandemic. This synthesis review is based on the empirical studies published in 2021-2025 related to school-going children and adolescents, where the interpretation of the age is performed through the adolescent framework and the school stage differences suggested by the World Health Organization. The evidence suggests problematic use is linked to the presence of depressive symptoms, anxiety, stress, sleep disturbance, loneliness, suicidal thoughts, impaired emotional regulation, and decreased psychological well-being. The relationship is highest and most steady when smartphone use is characterized by loss of control, withdrawal, craving, functional impairment, or compulsive engagement as opposed to time usage. Longitudinal studies indicate that distress is temporally correlated in both directions: having been vulnerable to problematic use before can lead to emotional symptoms, and that having permanent or developing dependence beforehand forecasts subsequent emotional symptoms. Pathways that seem to be significant include sleep disturbance, fatigue, cyberbullying, loneliness, fear of missing out, low self-esteem, poor self-regulation, and poor family or peer relationships. Evidence remains limited for children below age 10, for low- and middle-income settings outside Asia, and for causal effects of school-based interventions. Most studies are observational, rely on self-report, and use heterogeneous instruments and thresholds. The post-pandemic literature therefore supports targeted, developmentally appropriate prevention and early intervention, but not the assumption that every form of frequent or educational smartphone use is addictive or harmful.

Keywords: Smartphone Addiction, Adolescents, Mental Health, Depression, COVID-19 Pandemic

ICOH 093

From Sensory Processing Sensitivity to Environmental Action: The Emotional Pathways of Young Environmental Activists in India

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The world is at high risk of a climate crisis, characterized by increased temperatures, droughts, and floods. Indian youth are increasingly engaging in advocacy and litigation to demand greater accountability for environmental issues. The present study aimed to understand the factors contributing to environmental activism among young environmental activists in India. Specifically, the study examined the relationship between Sensory Processing Sensitivity (SPS) and Environmental Actions, with the mediating role of various Climate Emotions. A cross-sectional study was conducted with 313 individuals involved in environmental activism such as lake restoration, advocacy, and conservation. Participants completed the Highly Sensitive Person Scale -12, Environmental Identity Scale, Inventory of Climate Emotions, and Environmental Action Scale. The correlation results indicated a positive correlation between SPS, climate anger, and climate sorrow. Climate enthusiasm and climate guilt correlated with participatory action, while climate sorrow correlated with participatory and leadership actions. Welch's t-test revealed significant differences in terms of education on SPS, leadership action, and climate guilt. Climate sorrow fully mediated the relationship between SPS and participatory action. Climate anger and climate sorrow fully mediated the relationship between SPS and leadership action. The findings provide a greater understanding of the role of individual differences in personality and climate emotions in environmental engagement in the Global South. The findings are relevant in the global context of attaining the SDGs.

Keywords: Sensory Processing Sensitivity, Environmental Action, Climate Emotion, Environmental Activist, Mediation

ICH 094

Parental Employment Status and Loneliness among Children in Late Childhood: Implications for Child Mental Health and Psychosocial Well-Being

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Background: Loneliness is a key psychosocial concern in childhood and may affect children's emotional adjustment, social relationships, and psychological well-being. Family circumstances, including parental employment status, may be associated with children's

opportunities for parental interaction, emotional support, and companionship. Examining loneliness in relation to parental employment status may contribute to a better understanding of family-related factors associated with child mental health.

Objective: The study aimed to compare loneliness levels among children from working-parent families and stay-at-home-parent families and to examine the implications of the findings for child mental health and psychosocial well-being.

Methodology: The study adopted a descriptive-comparative research design. We purposively selected 30 children: 15 with working parents and 15 with stay-at-home parents. We assessed loneliness using a three-item measure adapted from Hughes et al. (2004) and a sociodemographic information sheet. We used descriptive statistics and an independent-samples t-test to compare loneliness scores between the two groups.

Results: Children from working-parent families obtained a higher mean loneliness score ($M = 12.40$, $SD = 1.55$) than children from stay-at-home-parent families ($M = 5.60$, $SD = 1.30$). The reported independent-samples t-test indicated a statistically significant difference between the groups, $t(28) = 13.88$, $p < .001$. The findings indicate differences in loneliness between groups but do not establish causation.

Conclusion: The findings emphasize the significance of considering children's emotional experiences within their family and social environments. Meaningful parent–child interactions, emotional support, and family engagement may help promote children's psychosocial well-being. Further research utilizing larger, more diverse samples is needed to examine the relationship between parental employment, parental availability, and childhood loneliness.

Keywords: Parental employment status, childhood loneliness, child mental health, psychosocial well-being, parent–child relationships.

ICOH 095

Mental Health in the One Health Framework: An Overlooked Dimension of Global Health

Dr. Kimberley D'Souza

Background: The One Health approach recognises the interdependence of human, animal and environmental health and has been widely applied to zoonotic diseases, antimicrobial resistance and environmental challenges. Despite the substantial global burden of mental disorders, mental health remains largely absent from One Health discourse and practice. This paper proposes a conceptual framework to integrate mental health as a core component of the One Health paradigm.

Methods: A structured narrative review was undertaken using PubMed, Scopus and Google Scholar to identify interdisciplinary literature published between 2010 and 2025. Evidence relating to environmental change, zoonotic diseases, human–animal interactions and psychological outcomes was synthesised to develop a conceptual framework for integrating mental health within One Health.

Results: The review identified three interconnected pathways through which mental health is influenced within One Health systems: (i) environmental pathways encompassing climate change, ecological degradation and disasters; (ii) zoonotic and health system pathways involving infectious disease outbreaks, public health responses and associated psychosocial impacts; and (iii) socio-ecological pathways linking livelihood insecurity, human–animal interactions and community resilience. These pathways demonstrate that mental health is both an outcome of and a determinant within interconnected human, animal and environmental systems. A pathway-based conceptual framework is proposed to guide research, surveillance and policy integration.

Conclusions: Recognising mental health as a cross-cutting dimension of One Health broadens the scope of multidisciplinary collaboration and supports more holistic, preventive and equitable public health strategies. Integrating mental health into surveillance, preparedness and policy has the potential to strengthen responses to emerging global health challenges and advance sustainable development.

Keywords: One Health, Mental Health, Climate Change, Zoonotic Diseases, Planetary Health

ICOH 096

Burnout and Stress as Emerging Public Health Challenges: Implications for Mental Wellbeing and Preventive Strategies - A Study of Undergraduate Students.

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Background: Academic stress and burnout among undergraduate students represent critical public health and human resource concerns. Escalating academic demands and pressures significantly impact student mental well-being and psychological resilience. This study assessed levels of academic burnout and stress among undergraduate students, examined their relationship with mental well-being, and identified institutional preventive strategies.

Methods: A quantitative cross-sectional study was conducted among 250 undergraduate students using a structured five-point Likert-scale questionnaire. The instrument evaluated academic stress and burnout experiences, effects on mental well-being, coping mechanisms, and institutional support preferences. Data were analyzed using descriptive statistics, Cronbach's alpha, Pearson correlation, and linear regression analysis.

Results: The questionnaire demonstrated high internal consistency (Cronbach's α = 0.834). Respondents reported elevated academic stress and burnout experiences, with stress items recording a mean score of 3.55 (SD = 0.72) and mental health disruption recording a mean score of 3.95 (SD = 0.74). A strong positive association was observed between academic stress and mental health disruption ($r = 0.555$, $p < 0.001$). Regression analysis showed that academic stress significantly predicted mental health disruption ($t = 10.513$, $p < 0.001$), explaining 30.8% of the variance ($R^2 = 0.308$). Students strongly supported institutional preventive measures, particularly structured university mental health and stress-management programs.

Conclusion: Academic stress and burnout substantially impair student mental well-being within educational environments. Universities must strengthen institutional prevention through manageable workloads, accessible mental health support, flexible academic policies, and structured resilience programs to foster healthier learning environments and safeguard human potential.

Keywords: Academic Burnout; Academic Stress; Student Mental Health; Preventive Strategies; Higher Education

ICOH 097

Seasonal variation, lifestyle factors and mental health: a narrative review of their interrelationships

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Aim: Seasonal variation, weather and climate change are affecting our lifestyle factors like physical activity, sleep, and sedentary behavior and directly or indirectly our mental health. This narrative review aims to examine the relationship between seasonal variation, lifestyle factors and mental health.

Methods: This narrative review examined scientific papers published between 2016 and September 2026. Databases PubMed, ScienceDirect, and Google Scholar were searched for publications relating to seasonality, sleep, physical activity, sedentary behavior, and mental health.

Results: Among the 27 studies included in the thematic synthesis, studies integrating seasonal variation, lifestyle factors and mental health within a single framework particularly among healthy adults remain limited. Studies show that sleep peaks in autumn, sedentary behavior in winter and physical activity in summer, light or moderate-to-vigorous physical activity and better sleep quality improved mental health. Evidence shows that there is a

bidirectional link between physical activity, sedentary behavior and mental health. Bright light exposure, physical activity, and sleep may mediate seasonal differences in psychological symptoms among youth with emerging mood disorders, and some studies suggest that seasonality is moderated by age and chronotype, with younger age and evening chronotype correlating with high seasonality scores. Some findings illustrate the heterogeneity in individual's seasonal depression variation and responses to weather.

Conclusion: The results of this review suggest that there are fewer studies integrating seasonal variation, lifestyle factors and mental health. More longitudinal and causal research is needed to clarify this relationship. Future research should investigate the extent to which lifestyle factors mediate the relationship between seasonal variation and mental health. Future studies should include repeated seasonal assessments, multiple lifestyle factors and diverse climatic context to strengthen causal inference.

Keywords: Keywords: Seasonal variation, sleep, physical activity, mental health.

PROJECT One Health™

Theme 7

Maternal, Child, and Reproductive Health & Community Nutrition

ICOH 098

Not too cold, not too warm - Ambient temperature and intimate partner violence among women in Tanzania

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Background: Climate change is an emerging public health threat of the 21st Century. However, there is sparse evidence on the impact of changing climate on IPV prevalent regions of the world.

Objectives: This study aims to examine the association between ambient temperature and IPV prevalence among partnered women in Sub-Saharan Africa.

Methods: This cross-sectional study utilised the data from the 2022 Demographic and Health Surveys of Tanzania including 4367 partnered women aged 15-49 years measuring experiences of physical, sexual and emotional violence perpetrated by current/former partner. We employed survey-weighted mixed effects multivariable logistic regression model and natural cubic spline models. Furthermore, a spatial analysis of the association was conducted for the observed period *i.e*., March 2021 – July 2022. For the climate data, we used the atmospheric reanalysis models of global climate from ERA5 Climate Data Repository.

Results : 4367 partnered women aged 15-49 in Tanzania were included in this study. 32.3% experienced IPV in the past 12 months, of which 23.6% of women experienced physical violence, 22.1% experienced emotional violence and 8.8% experienced sexual violence. In Tanzania, the annual temperature range was between 16°C – 28°C with an average of 22.9° C during the observed period. A significant non-linear association was found between ambient temperature and prevalence of IPV against women and its three subtypes. The minimum risk temperature was estimated at 18.4°C for the observed study period. The predicted risk of being subjected to IPV was high for lower and moderate temperatures in Tanzania.

Recommendations: The findings of this study highlight that, aside from the influence of extreme temperatures on IPV, changes in moderate temperature may be associated with increased IPV risk among women. Under rapidly changing climatic conditions, influence of external determinants in relation to IPV need to be drawn for closer consideration. These findings underline the need to integrate violence prevention strategies in national climate adaptation plans to ensure better preparedness and response of healthcare systems in the ongoing climate crisis.

Keywords: ambient temperature, intimate partner violence, climate change, environmental health, women

ICOH 099

Maternal Psychological Distress and Its Association with Nutritional Status Among Children Under Five Years: A Mixed-Methods Study in Urban Mysuru

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Introduction: Child undernutrition remains a major public health concern in India, and maternal psychological distress may influence child nutritional outcomes. This study assessed maternal psychological distress and undernutrition among children aged 6 months–5 years in Urban Mysuru, examined their association, and explored maternal experiences, feeding practices, and sociocultural influences on caregiving.

Methodology: A sequential explanatory mixed-methods study was conducted among mother–child pairs attending Anganwadi centres in Urban Mysuru, Karnataka. The quantitative phase included 175 pairs recruited through two-stage cluster sampling with proportional allocation. Maternal psychological distress was assessed using the Kessler Psychological Distress Scale (K10), with scores ≥20 indicating significant distress. Child nutritional status was assessed using WHO weight-for-height (WHZ), weight-for-age (WAZ), and height-for-age (HAZ) Z-scores. Dietary diversity was assessed using a 24-hour dietary recall and a 14-food-group score. Associations were examined using Kruskal–Wallis tests and multivariable linear regression. The qualitative phase included nine purposively selected in-depth interviews, analysed thematically and integrated through explanation-building.

Results: Among 175 children, 30.8% were stunted, 23.4% underweight, and 13.7% wasted. Maternal psychological distress was present in 44.0% of mothers, predominantly mild. Distress categories were significantly associated with WAZ, WHZ, and HAZ (all $p < 0.001$), but not dietary diversity ($p = 0.092$). Higher K10 scores remained significantly associated with poorer WAZ ($B = -0.824$, $\beta = -0.469$), WHZ ($B = -0.606$, $\beta = -0.288$), and HAZ ($B = -0.720$, $\beta = -0.300$), with the strongest association for WAZ. Qualitative findings highlighted emotional strain, inconsistent or impaired feeding responsiveness, workload pressures, cultural feeding beliefs, and intergenerational influences. Family support and Anganwadi supplementary nutrition appeared to buffer food access

Conclusion: Maternal psychological distress was significantly associated with poorer child anthropometric outcomes, particularly WAZ. The lack of association with dietary diversity suggests that feeding responsiveness and consistency may be important pathways. Integrating maternal mental health into community-based nutrition services may be beneficial. Longitudinal research is needed to clarify temporal and causal relationships.

Keywords: Maternal psychological distress, child undernutrition, Kessler Psychological Distress Scale (K10), anthropometric Z-scores, infant and young child feeding (IYCF)

ICOH 100

Determinants of Different forms of Domestic Violence among married women in India; Demystifying from NFHS-5.

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Domestic violence (DV) remains significant against women in India, it is a concern of public health and human rights which is adversely affecting the physical, mental and the social well- being of women worldwide. Despite burden of domestic violence is significant. Significantly continue to be substantiated in India. this study in analyze the prevalence of various forms of domestic violence and identify the social cultural and economic economic determinants associated with domestic violence among above marriage women in India first term. A qualitative cross sectional study design is employed using secondary data from the national family health service file in (NFHS-5), which is conducted during 2019-2021. The given analysis was based on women who participated in the domestic violence module of the survey. Descriptive statistics were used to assess the prevalence of emotional physical and sexual violence why in the binary Logistic regression analysis was performed to an exam the association between domestic violence and the selected social demographic Economic and The Other respective behavioral factors. The findings indicate that domestic remains prevalent among Indian women, with emotional surgical sexual reported across diverse social economic group education attainment well status place of president employment status alcohol consumption by husband/ Partners and others social cultural characteristics for found influence like the likelihood of experience in domestic violence. women belonging to disadvantaged social economic groups and those who partners exhibited more vulnerability to experience in violence. This study highlights the multifaceted nature of domestic violence and underscores the importance of addressing both social economic inequalities and behaviour as factors through target interventions Women empowerment, improving education opportunities enhancing awareness programs and implementing effective support mechanisms to reduce the burden of domestic violence in India.

Keywords: Domestic Violence, behavioural factors, sexual violence, socio- demographics, NFHS-5

ICOH 101

Outcomes of Community-Based Mammography Camps in urban Rohtak, Haryana

Himani

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Background: Breast cancer is an important public health concern, and early detection can facilitate timely evaluation and management. Community-based mammography camps may improve access to breast cancer screening and help identify women requiring further assessment.

Methods: Three mammography camps were conducted on 26, 28 and 29 July 2025 in Rohtak, Haryana. A total of 62 mammography reports were compiled and reviewed. Data regarding age and mammographic breast composition according to the American College of Radiology (ACR) categories were analyzed using descriptive statistics. Frequencies and percentages were calculated for categorical variables.

Results: A total of 62 women were screened across the three camps. The largest proportion of women belonged to the 50–59-year age group. Regarding breast composition, ACR category C (heterogeneously dense breasts) was the most common finding. BI-RADS 3 was noted in 9 women, BI-RADS 4A findings were mentioned only in two reports. Conclusion: No cancer case was detected on initial screening. Community-based screening camps can provide an opportunity to assess breast composition and identify women who may require further evaluation. Further analysis of individual radiological impressions and follow-up outcomes is needed to establish the frequency of abnormal findings and the breast cancer detection rate.

Keywords: Breast cancer screening, Mammography, Community-based screening, Rohtak.

ICOH 102

Innovative Solutions to Tackle Malnutrition: A Systematic Review of Community, Digital, and Policy Interventions with Special Reference to India

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Background: Malnutrition remains a major public health challenge worldwide, contributing to increased morbidity, mortality, impaired cognitive development, and reduced productivity. Despite significant progress through national nutrition programmes, India continues to experience a high burden of stunting, wasting, underweight, and anaemia, particularly among children, women, and vulnerable populations. Emerging innovations such as digital health, artificial intelligence (AI), community participation, behaviour change communication,

biofortification, and multisectoral policy interventions offer promising opportunities to strengthen nutrition programmes and improve health outcomes.

Objectives: To systematically review the evidence on innovative interventions for preventing and reducing malnutrition, evaluate their effectiveness, identify implementation barriers and facilitators, and assess their applicability within the Indian context.

Methods: A systematic review was designed in accordance with the PRISMA 2020 guidelines. Electronic databases including PubMed, Scopus, Web of Science, Embase, Cochrane Library, and Google Scholar were searched for studies published between 2015 and 2026. Eligible studies included randomized controlled trials, quasi-experimental studies, cohort studies, cross-sectional studies, implementation research, and programme evaluations assessing innovative nutrition interventions. Data were extracted using a standardized format, and methodological quality was assessed using validated risk-of-bias tools.

Results: A total of 56 studies were included. Community-based interventions, behaviour change communication, food fortification, and nutrition-sensitive agriculture demonstrated the strongest evidence for improving dietary diversity, child growth, and reducing anaemia. Digital health interventions, including mobile applications, tele-nutrition, and electronic growth monitoring, improved programme coverage and beneficiary follow-up, AI-assisted screening and digital surveillance systems showed promising potential for early identification of children at risk of malnutrition. Indian initiatives such as POSHAN Abhiyaan, POSHAN Tracker, and Anemia Mukt Bharat highlighted the value of technology-enabled monitoring and multisectoral convergence, although implementation challenges persisted in resource-constrained settings.

Conclusion: Innovative, technology-enabled, and community-driven interventions can complement conventional nutrition programmes and accelerate progress toward reducing malnutrition in India. Strengthening digital infrastructure, community engagement, and intersectoral collaboration will be essential for achieving sustainable nutrition outcomes and supporting national and global nutrition targets.

Keywords: Malnutrition; Systematic Review; Digital Health; Artificial Intelligence; Community Nutrition

ICOH 103

A study to assess the effectiveness of planned teaching program regarding personal safety among adolscent girls in selected areas of Ahmedabad city

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Introduction: Adolescent girls face heightened risks of personal safety violations and abuse, highlighting an urgent need for targeted educational interventions within forensic nursing frameworks. Bridging gaps in both cognitive understanding and affective perception is critical for empowering young females and fostering sustained protective behaviors. This study aimed to evaluate the effectiveness of a planned teaching program regarding personal safety among adolescent girls in selected areas of Ahmedabad City and to develop an information booklet.

Methods: A quantitative study utilizing a single-group pre-test and post-test design was conducted among 200 adolescent girls (N = 200). Baseline levels of knowledge and attitudinal satisfaction were evaluated before delivering a structured teaching program. Post-intervention outcomes were measured to quantify knowledge gains and satisfaction shifts. Statistical analyses included mean scores, Standard Deviation (SD), Standard Error of the Mean (SEM), and Pearson correlation coefficients (r) evaluated at $p < .001$.

Results: Following intervention, mean Knowledge scores improved significantly from 9.57 (±2.403) to 12.82 (±1.573), with participants shifting from a majority at the 39; Moderate 39; level (57%) at pre-test to a dominant 39; Adequate 39; level (92%) at post-test. Attitude satisfaction increased from a mean of 21.62 to 46.32. Pre-intervention, 90% reported dissatisfaction, whereas post-intervention, 92% were; Satisfied; Very Satisfied; (49% reaching highest satisfaction). Statistically significant positive correlations were confirmed for Knowledge ($r = .330$, $p < .001$) and Attitude ($r = .584$, $p < .001$).

Discussion & Conclusion: The planned teaching program proved highly effective in enhancing personal safety awareness and standardizing comprehension. The stronger correlation in attitude underscores the vital role of baseline perceptions in shaping affective outcomes. Engaging the affective domain alongside cognitive instruction is essential for long-term retention and behavioral empowerment in forensic nursing practice.

Keywords: Educational Intervention, Knowledge Acquisition, Attitudinal Change, Forensic Nursing, Adolescent Girls, Personal Safety.

ICOH 104

Point-of-Care Hemoglobin Estimation: A Cross-Sectional Study Among Women of Reproductive Age in Coastal Karnataka

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Background: Anemia is a widespread public health problem among women of reproductive age in India, contributing to adverse maternal and child health outcomes. Timely identification and management are crucial, particularly in low-resource settings. TrueHb, a portable hemoglobinometer, offers a rapid, point-of-care alternative to conventional laboratory testing and has the potential to enhance preventive services in primary care.

Objective: 1. To estimate the validity of screening tool TrueHb digital hemoglobinometer against the gold standard method automated analyser, 2. To estimate the prevalence of anemia among the women of reproductive age using automated analyser.

Methods And Materials: This cross-sectional study was conducted over a four-month period from July to October 2025 and included 111 women of reproductive age group conducted in various PHC's of coastal Karnataka. Convenience sampling was employed, and a semi-structured questionnaire was used to collect demographic data and information on risk factors. Haemoglobin levels were measured using both the digital hemoglobinometer and the automated analyser. Sensitivity, specificity, positive predictive value, and negative predictive value were calculated to assess the validity of the digital hemoglobinometer.

Results: A study of 111 reproductive-age women compared a digital hemoglobinometer to an automated analyser. The hemoglobinometer estimated higher mean haemoglobin (12.6) and anaemia prevalence (41.44%) than the analyzer (11.8 and 25.22%). The device demonstrated 89.28% sensitivity, 74.69% specificity, and a 93.6% limit of agreement.

Conclusion: The digital hemoglobinometer is a highly sensitive and valid screening tool for anaemia, despite slightly overestimating haemoglobin.

Keywords: Anemia, Hemoglobinometer, Women, Validity, Point-of-Care Testing

PROJECT One Health™

Theme 8

Chronic Diseases, Public Health Vulnerabilities, and Clinical Epidemiology

ICOH 105

Assessment of the quality of life of people living near Vembanad lake, Alappuzha, Kerala – a mixed study

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Vembanad Lake is an ecologically sensitive wetland that supports the livelihoods of many residents. From a One Health perspective, the quality of life (QoL) of people is closely linked to the health of the lake ecosystem they rely on. However, the QoL of communities living near the lake remains understudied. This study assessed QoL across four domains using the WHOQOL-BREF questionnaire. Methods: A cross-sectional mixed-methods study was conducted among 260 participants living within 4 km of the lake between March and April 2024. Associations between selected sociodemographic and health-related factors and the four QoL domains were examined. Additionally, 17 in-depth interviews explored the major enablers and barriers to QoL. Results: The Social Relationships domain recorded the highest mean score (14.86 ± 3.31) and the Environmental domain the lowest (12.59 ± 2.70) (mean ± SD; higher scores indicate better QoL). Higher healthcare access was associated with higher scores in all four domains and was the only factor associated with the Psychological, Social Relationships and Environmental domains. Physical QoL was additionally associated with current illness, educational level, marital status, and age. Qualitative findings identified lake-dependent livelihoods, community support, and environmental comfort as enablers of QoL, while flooding, water pollution, poor service accessibility, and livelihood insecurity were key barriers. Conclusion: QoL in this lake-dependent community is shaped by individual health factors and shared ecological conditions. Improving wellbeing requires integrated primary healthcare strengthening along with flood and pollution management.

Keywords: Environmental Health, Health Services accessibility, Lake-dependent communities, WHOQOL-BREF

ICOH 106

Developmental Crisis and Emergence of Diseases in Gangnauli, Uttar Pradesh

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Background: Gangnauli, a village in Baghpat district of Western Uttar Pradesh, was highlighted as a cancer district of Uttar Pradesh. Following the news reported by an independent journalist, a discussion with a local environmentalist motivated us to do an academic investigation. The discussion with the local activist raised primarily two academic

curiosities. First, to understand the underlying causes of emerging diseases from peoples' perspective and second to triangulate and collect evidence of cancer cases in the village.

Research Methodology: The nature of study was qualitative, using both primary and secondary sources of data. The study applied multiple research tools such as focused group discussion with ASHA workers and interviews with multiple stakeholders like cancer patients, care-givers, local healthcare providers, head of the village, agro-input shop owners, and farmers. In addition to that observations and informal discussion with villagers were also included.

Findings: A report submitted to the sub-district officer, documented six active cancer cases and eight hepatitis patients from the village. The residents claim it as an understated number. They recalled that cancer cases started attracting their attention nearly a decade ago. Since then, around 350-400 cases and 150-200 fatalities have been estimated. They also reported animal mortality as a concern that needs further investigation. The people's perspectives attributed these emerging health issues of both human and animal to historical shifts in agricultural practices from diverse cropping to monoculture cropping of sugarcane with intensive fertilizer use and water intake, and changing developmental paradigms. The technocentric development paradigm under three different political leaders Choudhary Charan Singh, Ajit Singh and Hukum Singh led to environmental degradation and industrial pollution. Changing lifestyles and inadequate public health infrastructure in rural areas are other issues that have exacerbated the environmental health challenges.

Conclusion: Our findings suggest that there is a need to do more research in this area from different perspectives including One Health framework. Over and above, there is a need to strengthen the public health system in rural areas.

Keywords: Devlopmental Crisis, Health, Water Contamination, Cancer

ICOH 107

Strengthening School-Based Vision Screening Through Teacher Training: A Community-Based One Health Approach

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Background: Uncorrected refractive error and amblyopia are preventable causes of childhood visual impairment, yet eye-care specialists are scarce, particularly in rural areas. Teachers observe children daily and can support early detection and referral, an intersectoral, community-based prevention approach consistent with the One Health philosophy.

Objectives: To assess the knowledge, attitude and practice (KAP) of primary school teachers regarding children's eye health and to pilot-test the KAP questionnaire, as the first phase of a study developing a structured vision-screening training module.

Methodology: A cross-sectional pilot study was conducted among 20 primary school teachers from government and private, urban and rural schools in Dakshina Kannada, Karnataka. Reliability was assessed using KR-20 (knowledge, practice) and Cronbach's alpha (attitude). Groups were compared using t-test/Mann-Whitney U test and associations using Spearman correlation.

Results: Mean age was 36.45 ± 8.52 years; 75% were female, 70% worked in private schools and 65% in urban areas. Only 15% had received training on children's health or vision. Just 20% correctly identified 6/6 as normal visual acuity, 50% did not know, and 60% could not identify amblyopia. Mean knowledge score was 3.75 ± 1.29 (of 7). Although 95% agreed that poor vision affects academic performance, 35% reported taking no action on suspected vision problems. Scores did not differ significantly by gender, school type or location ($p > 0.05$). The attitude scale showed good reliability ($\alpha = 0.852$); knowledge (KR-20 = 0.285) and practice (KR-20 = 0.253) scales required item revision.

Conclusion: Teachers showed favourable attitudes but important gaps in knowledge and referral practice, supporting structured training. Integrating trained teachers into school-based vision screening may strengthen the interface between education, primary health care and eye-care services, supporting accessible, preventive child-health initiatives within a One Health framework.

Keywords: School Vision Screening; Teachers; KAP; Childhood Visual Impairment; Community Health; One Health

ICOH 108

Fault Lines of Protection: A Composite Index Approach to Health-Induced Poverty Vulnerability in South India

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High out-of-pocket healthcare expenditure continues to expose Indian households to the risk of impoverishment despite substantial expansion of publicly financed health insurance. This study examines how household vulnerability to health-induced poverty has evolved across South India between the immediate post-PMJAY period (2019–2020) and the post-pandemic recovery and policy-maturation period (2023–2024). We construct a Health-Induced Poverty Vulnerability Index (HIPVI) using 55,695 household observations from the Consumer

Pyramids Household Survey covering 20 homogeneous regions across Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, and Telangana. Vulnerability is estimated using the Vulnerability as Expected Poverty framework, with determinants assessed through fractional logit models. Decomposition analysis based on Andersen's Behavioural Model identifies the relative importance of predisposing, enabling, and need factors, while Global Moran's I and Local Indicators of Spatial Autocorrelation examine the spatial concentration of vulnerability.

Mean household vulnerability declined modestly from 0.711 to 0.696, but this aggregate improvement conceals substantial heterogeneity. Health insurance emerged as a strong protective correlate, with its coefficient increasing in magnitude from −0.440 to −0.748. In contrast, regular medication use became increasingly associated with vulnerability (0.060 to 0.123), highlighting persistent financial exposure related to chronic and outpatient care. The association of hospitalization reversed from positive (0.336) to negative (−0.422). Enabling factors, particularly income and insurance, accounted for more than 80% of explained vulnerability in both periods. Spatial patterns also changed markedly, from no significant clustering in 2019–2020 (Moran's I=−0.0487, p=0.49) to significant positive clustering in 2023–2024 (I=0.2617, p=0.018), with a high-vulnerability cluster spanning parts of Andhra Pradesh and Tamil Nadu. The findings demonstrate that improvements in aggregate financial protection can coexist with persistent chronic-care exposure and widening spatial differentiation, underscoring the need for outpatient and medicine coverage alongside geographically targeted financial-protection strategies.

Keywords: Health Insurance; Poverty Vulnerability; Out-of-Pocket Expenditure; Spatial Inequality; Universal Health Coverage

ICOH 109

Human Immunodeficiency Virus: Assessment of the Hepatotoxic, Nephrotoxic, and Pancreatic Toxic Effects of Antiretroviral Therapy in People Living with HIV in Brazzaville

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Background: Antiretroviral therapy (ART) has markedly improved the survival of people living with HIV (PLHIV), but prolonged treatment may cause hepatic, renal, and pancreatic toxicities. Data on these complications remain limited in the Republic of Congo.

Methods: A longitudinal before-and-after study was conducted from June to December 2025 among 132 adults receiving ART for at least six months. Serum creatinine estimated creatinine clearance, AST, ALT, serum amylase, and fasting blood glucose were assessed at baseline (M0) and after at least six months of treatment (M≥6). Paired comparisons were performed, with statistical significance set at $p < 0.05$.

Results: The mean age was 52.3 ± 11.9 years, and 72.7% of participants were women. The most frequently prescribed regimen was dolutegravir/lamivudine/tenofovir disoproxil fumarate (75%). Significant changes were observed in serum creatinine ($p = 0.040$), creatinine clearance ($p = 0.007$), serum amylase ($p = 0.027$), and ALT ($p = 0.003$). No significant changes were found for AST or fasting blood glucose.

Conclusion: ART was associated with significant renal, hepatic, and pancreatic biochemical alterations, highlighting the need for routine biological monitoring to facilitate early detection and management of treatment-related toxicities.

Keywords: HIV, hépatotoxic, Nephrotoxic, Pancreatic, Antitiretroviral Therapy, People Living with HIV, Brazzaville

ICOH 110

Effectiveness of Interventions to Improve Antihypertensive Medication Adherence Among Adults with Hypertension in India: A Systematic Review

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Background: Medication non-adherence is a leading driver of uncontrolled hypertension in India, yet no quantitative synthesis of adherence-improving interventions exists for this setting. We systematically reviewed and meta-analysed randomised controlled trials (RCTs) and before-after studies evaluating such interventions among adults with hypertension in India.

Methods: We searched PubMed, Web of Science, Scopus, and Embase from inception. Eligible studies enrolled adults with hypertension in India, employed a validated adherence instrument, and tested any structured adherence intervention. Two RCTs sharing a common adherence scale (MMAS-8) were pooled using a random-effects model (REML estimator) for three pre-specified outcomes: medication adherence score, systolic blood pressure (SBP), and diastolic blood pressure (DBP). Risk of bias was assessed using Cochrane RoB 2 (RCTs) and the JBI quasi-experimental checklist (before-after studies).

Results: Five studies (n = 2,478; three RCTs, two before-after) from three Indian states (2019–2025) were included. Interventions included nurse-led multimodal education, community peer-support, barrier-tailored counselling, and mHealth reminders. Two low-risk-

of-bias RCTs were pooled. Adherence improved significantly (MD +0.74 MMAS units; 95% CI 0.53–0.95; $p < 0.0001$; $I^2 = 48.7\%$), SBP fell by −2.99 mmHg (95% CI −5.73 to −0.24; $p = 0.03$; $I^2 = 65.8\%$), and DBP by −1.69 mmHg (95% CI −2.85 to −0.53; $p = 0.004$; $I^2 = 11.5\%$). Both before-after studies showed large pre-post improvements but lacked control groups.

Conclusions: Structured adherence interventions significantly improve medication adherence and reduce blood pressure in Indian hypertensives. Larger, harmonised trials with longer follow-up are urgently needed.

Keywords: hypertension; medication adherence; MMAS; blood pressure; India; systematic review; meta-analysis

ICOH 111

Disease Modifying Antisense Oligonucleotide Therapy in Dravet Syndrome: Clinical Efficacy, Seizure Reduction and Neurodevelopmental Outcomes.

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Background: Dravet syndrome (DS) is a developmental and epileptic encephalopathy commonly associated with SCN1A gene mutations that result in haploinsufficiency of the NaV1.1 sodium channel. Zorevunersen (STK-001), an antisense oligonucleotide (ASO), is designed to increase productive SCN1A transcript and NaV1.1 protein expression, offering a potential disease-modifying therapeutic approach.

Objectives: To evaluate the evidence regarding the efficacy, safety, and potential disease-modifying effects of antisense oligonucleotide therapy in Dravet syndrome, focusing on seizure control and neurodevelopmental outcomes.

Methods: Relevant preclinical and clinical studies investigating zorevunersen in DS were reviewed using a narrative approach. Outcomes of interest included seizure frequency, safety and tolerability, pharmacodynamic effects, survival in preclinical models, and neurodevelopmental measures, including cognition and adaptive behavior.

Results: ASO therapy demonstrated significant and durable reductions in seizure frequency in patients with DS, accompanied by favorable safety and pharmacodynamic profiles. Early-life administration in preclinical models resulted in prolonged survival, improved seizure phenotypes and normalization of interneuron excitability. Clinical studies reported improvements not only in seizure control but also in adaptive behavior and cognitive function,

suggesting benefits beyond symptomatic relief. However, the magnitude and durability of these neurodevelopmental benefits remain uncertain, particularly in patients with established developmental impairment. Complementary genetic approaches, including viral gene delivery, are under investigation to enhance therapeutic efficacy.

Conclusion: According to the evidence provided, Antisense oligonucleotide therapy can be established as a plausible disease-modifying treatment for Dravet syndrome. Zorevunersen has shown supportive clinical results, while preclinical studies show increased productive SCN1A expression, reduced seizures, and improved survival in mouse models. These findings suggest that targeting SCN1A may improve seizure control and neurodevelopmental outcomes, but further studies are needed to establish long-term neurodevelopmental outcomes.

Keywords: Dravet syndrome, Zorevunersen, SCN1A, Gene mutations, antisense oligonucleotide

ICOH 112

Incremental Renoprotection from Endothelin-A Receptor Blockade on Top of RAS and SGLT2 Inhibition in Proteinuric CKD

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Background: With dual renin-angiotensin system treatment and SGLT2 inhibitors, proteinuria and kidney disease progression remain a concern. Endothelin-1 acting through endothelin A receptors (ETA) increases pressure, in the kidney filters damages blood vessels and causes scarring. Blocking these receptors specifically targets these processes offering extra protection and slowing kidney decline.

Aim: The aim of the study is to evaluate the renoprotective effects of endothelin-A receptor blockade on top of RAS and SGLT2 inhibition in patients with proteinuric CKD.

Methods: In phase two of the ZENITH-CKD trial, patients with kidney disease with or without type 2 diabetes were studied while receiving renin-angiotensin system inhibitor therapy. They were randomly assigned to high-dose zibotentan 1.5 mg plus dapagliflozin 10 mg, low-dose zibotentan 0.25 mg plus dapagliflozin 10 mg, or dapagliflozin 10 mg with placebo. The main goal was the percent change in urinary albumin-to-creatinine ratio (UACR) after 12 weeks.

Secondary goals evaluated fluid-related side effects and changes in blood pressure, HbA1c, LDL cholesterol, and uric acid levels.

Results: Across clinical trials, such as ZENITH-CKD and ALIGN adding a selective ETA receptor antagonist—zibotentan 1.5 mg or atrasentan—to stable RAS and SGLT2 inhibitor therapy produced a notable drop in urinary albumin-to-creatinine ratio. The reduction ranged from 27 % to 34 % versus SGLT2 inhibition alone over 12 to 24 weeks with a significant p-value ($p < 0.0001$). Combining SGLT2-driven arteriolar constriction with ETA-mediated efferent arteriolar vasodilation lowered intraglomerular pressure more effectively. Importantly SGLT2 inhibition countered the retention normally seen with ETA receptor antagonist therapy leading to less weight gain and fewer heart-failure events than, with ERA monotherapy alone. Long-term eGFR slope data confirm sustained kidney function preservation.

Conclusion: Blocking the endothelin A receptor adds kidney protection and reduces protein in urine when used with RAS and SGLT2 inhibitors in proteinuric CKD. Adding SGLT2 drugs helps avoid retention, from Endothelin receptor antagonist (ERA) treatment. This triple therapy—RAS inhibitor, SGLT2 inhibitor and selective ETA receptor blockade—is a well-tolerated way to slow CKD progression

Keywords: Chronic kidney disease, Endothelin A receptor antagonists, SGLT2 inhibitors, Zibotentan, Albuminuria.

ICOH 113

Therapeutic Potential of Melanocortin-4 Receptor Agonism in Acquired Hypothalamic Obesity

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Background: Acquired hypothalamic obesity (HO) is a severe, treatment-resistant form of obesity that can follow hypothalamic injury from craniopharyngioma or treatment. Damage to hypothalamic energy-balance circuits disrupts leptin and melanocortin signalling, causing hyperphagia, reduced energy expenditure, and rapid weight gain. The melanocortin-4 receptor (MC4R) is a key downstream mediator of appetite suppression; setmelanotide, an MC4R agonist, is designed to restore satiety signalling despite upstream hypothalamic injury.

Aim: The study aims to evaluate the therapeutic potential of MC4R agonism with setmelanotide in acquired hypothalamic obesity, focusing on body-mass index (BMI) reduction, hyperphagia, hunger, quality of life, and safety.

Methods: Phase 2 open-label trial (NCT04725240) and the phase 3 randomised, double-blind, placebo-controlled TRANSCEND trial (NCT05774756) was reviewed. In the phase 2 study, 18 patients with MRI-confirmed hypothalamic damage and severe obesity received escalating doses of subcutaneous setmelanotide for 16 weeks. In TRANSCEND, 120 participants aged 4–66 years were randomised to setmelanotide or placebo for 52 weeks. Outcomes included percentage change in BMI, proportion achieving ≥5% and ≥10% BMI reduction and other scores.

Results : In phase 2 trial, the mean BMI reduction was 14.9%–15% after six weeks. At six months of continued treatment, 84.6% had 10% BMI reduction from the index-trial baseline. In TRANSCEND, BMI reduced by 16.5% at 52 weeks, whereas BMI increased by 3.3% with placebo, yielding a placebo-adjusted BMI reduction of 19.8%. In acquired HO with secondary adrenal insufficiency, acute adrenal insufficiency was in 5% of treated patients, and sodium disturbances seen in central diabetes insipidus patients.

Conclusion: MC4R agonism with setmelanotide is a major advancement in acquired hypothalamic obesity, producing sustained BMI reduction, reduced hunger, and improved quality of life in a condition previously managed mainly with lifestyle measures and bariatric surgery.

Keywords: Hypothalamic Obesity, Melanocortin-4 Receptor

ICOH 114

Bispecific Antibody Prophylaxis Versus Factor VIII Replacement Therapy in Haemophilia A: A Comparative Analysis

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Background: Haemophilia A management traditionally relies on frequent intravenous factor VIII infusions causing high treatment burden, venous access complications and breakthrough bleeding risks. Subcutaneous emicizumab addresses this problem by providing haemostatic protection through bispecific antibody prophylaxis without requiring frequent intravenous access.

Aim: To compare the safety and effectiveness of subcutaneous emicizumab prophylaxis with traditional factor VIII replacement therapy in terms of lowering bleeding frequency and treatment burden in patients with hemophilia A.

Methods: A comparative review was conducted to assess bispecific antibody prophylaxis and conventional factor VIII replacement in patients with hemophilia A. Relevant clinical trials and observational studies were identified from major medical databases using terms related to hemophilia A, prophylaxis, factor VIII replacement, and bispecific antibodies. Studies reporting bleeding frequency, annualized bleeding rates, safety, treatment adherence, and quality of life were included. The findings were synthesized to compare the clinical advantages of both therapeutic approaches.

Results: The analysis included the HAVEN 3 trial, which evaluated three emicizumab dosing regimens. Among patients without factor VIII inhibitors who had previously received prophylaxis or on-demand therapy, once-weekly efanesoctocog alfa showed significantly lower annualized bleeding rates than once-weekly emicizumab. The reduction was observed for overall bleeding, treated bleeding, and treated joint bleeding, with incidence rate ratios of 0.33, 0.49, and 0.51, respectively. Efanesoctocog alfa also demonstrated greater improvements in Hemophilia Joint Health Score outcomes, with significant reductions in both joint and total scores compared with emicizumab. Overall, the findings indicate that once-weekly efanesoctocog alfa provided superior bleeding control and joint health outcomes in this patient population.

Conclusion: Antibody prophylaxis, with emicizumab provides control of bleeding makes treatment easier to manage and lowers the overall impact of haemophilia A compared to traditional factor VIII replacement therapy.

Keywords: Hemophilia A, Emicizumab, Factor VIII, Prophylaxis, Annualized bleeding rate.

ICOH 115

Combination Incretin-Amylin Therapy for Obesity: Efficacy, Metabolic Outcomes and Gastrointestinal Tolerability

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Background: Obesity is a growing global health burden, with approximately 16% of adults aged 18 years and older living with obesity in 2024. Incretin-based therapies, particularly dual GIP/GLP-1 receptor agonists, produce substantial weight loss, while amylin analogues may enhance satiety and glycaemic regulation. Combination incretin–amylin therapy, such as

cagrilintide–semaglutide (CagriSema), represents a promising strategy for achieving greater weight reduction and metabolic improvement.

Aim: The study aims to evaluate the efficacy, metabolic outcomes, and gastrointestinal tolerability of combination incretin–amylin therapy in adults with overweight or obesity.

Methods: Recent PubMed-indexed randomised clinical trials published within the last five years were reviewed, focusing on phase 2 and phase 3 studies of cagrilintide–semaglutide and tirzepatide. Parameters considered included percentage change in body weight, proportion achieving ≥5%, ≥10%, and ≥25% weight loss, waist circumference, HbA1c, lipid profile, blood pressure, and gastrointestinal adverse events including nausea, vomiting, diarrhoea, constipation, and abdominal pain. Treatment duration ranged from 20 to 72 weeks.

Results: In the REDEFINE 1 trial, cagrilintide–semaglutide produced a mean body-weight reduction of 20.4% at 68 weeks versus 3.0% with placebo, representing an 83.3% relative reduction in body weight compared with placebo. With full treatment adherence, weight loss reached 22.7%, and 40.4% of participants achieved at least 25% weight loss. Gastrointestinal adverse events occurred in 79.6% of the combination group versus 39.9% with placebo, with nausea and vomiting being the most common symptoms. These events were predominantly mild to moderate and transient, with discontinuation due to gastrointestinal effects reported in only 5.9% of participants.

Conclusion: Combination incretin–amylin therapy demonstrates superior efficacy in promoting weight loss and improving metabolic parameters compared with placebo and monotherapy approaches. Although gastrointestinal adverse events are common, they are generally mild to moderate and rarely lead to treatment discontinuation, supporting the overall favourable benefit–risk profile of this therapeutic class.

Keywords: Obesity, Amylin Analogues, GLP-1 Receptor Agonists, Metabolic Outcomes, Gastrointestinal Tolerability

ICOH 116

Complement Factor B Inhibition in IgA Nephropathy: Renal Efficacy and Clinical Outcomes

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Background: IgA nephropathy (IgAN) is the most common primary glomerulonephritis worldwide and a leading cause of progressive chronic kidney disease. Persistent proteinuria and declining estimated glomerular filtration rate (eGFR) predict kidney failure. Dysregulation of the alternative complement pathway contributes to glomerular inflammation and injury;

factor B is a central amplification enzyme in this pathway. Iptacopan is an oral, selective factor B inhibitor designed to reduce alternative-pathway activation while preserving other immune functions.

Aim: The study aims to evaluate the renal efficacy and clinical outcomes of complement factor B inhibition with iptacopan in adults with IgAN, focusing on proteinuria reduction, preservation of kidney function, and safety.

Methods: The study synthesised evidence from the phase 2 study (NCT03373461) and the phase 3 APPLAUSE-IgAN randomised controlled trial (NCT04578834). Patients had biopsy-proven IgAN, persistent proteinuria despite optimised supportive care, and eGFR ≥30 mL/min/1.73 m². Iptacopan 200 mg twice daily was compared with placebo on 24-hour urine protein-to-creatinine ratio (UPCR) at 9 months and annualised total eGFR slope over 24 months. Secondary outcomes included achievement of UPCR <1 g/g, eGFR preservation, and adverse events including infection risk.

Results: In APPLAUSE-IgAN, iptacopan reduced 24-hour UPCR by 38.3% relative to placebo at 9 months. At 24 months, the annualised total eGFR slope was −3.10 mL/min/1.73 m²/year with iptacopan versus −6.12 with placebo, a between-group difference of 3.02 mL/min/1.73 m²/year, representing approximately 49.3% slowing of kidney-function decline. By 24 months, 41.0% of iptacopan-treated patients achieved UPCR <1,000 mg/g compared with 24.0% receiving placebo. In the phase 2 study, the 200 mg twice-daily dose reduced UPCR by up to 40% versus placebo at 6 months, with no serious treatment-related adverse events. Infection rates were not significantly different between iptacopan and placebo in the phase 3 interim analysis.

Conclusion: Complement factor B inhibition with iptacopan provides clinically meaningful renal protection in IgAN, producing a 38.3% greater proteinuria reduction than placebo and slowing eGFR decline by approximately 3 mL/min/1.73 m² per year. These findings establish alternative-pathway blockade as a disease-modifying strategy beyond supportive care, with a favourable early safety profile. Long-term follow-up remains important to confirm durable kidney-failure prevention and infection safety.

Keywords: Iptacapon, APPLAUSE Ig-AN

ICOH 117

Targeted Biologic Therapy in Lupus Nephritis: Renal Response, Proteinuria Reduction and Steroid-Sparing Effects of Contemporary Therapies.

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Background: Lupus nephritis (LN) is a major cause of morbidity in systemic lupus erythematosus, with persistent proteinuria, progressive renal dysfunction, and prolonged glucocorticoid exposure contributing to adverse outcomes. Belimumab, a B-cell activating factor (BAFF) inhibitor, and obinutuzumab, a type II anti-CD20 monoclonal antibody, represent targeted biologic approaches to improving renal outcomes while reducing treatment burden.

Objective: To evaluate the efficacy of belimumab and obinutuzumab in lupus nephritis, focusing on renal response, proteinuria reduction, and glucocorticoid-sparing effects.

Methods: A literature-based review was conducted using pivotal phase III randomized controlled trials and supporting clinical evidence. The BLISS-LN trial evaluated belimumab plus standard therapy versus standard therapy alone over 104 weeks, while the REGENCY trial assessed obinutuzumab plus standard therapy versus placebo plus standard therapy at week 76. Outcomes included primary or complete renal response, proteinuria-related endpoints, glucocorticoid reduction, and safety.

Results: In the BLISS-LN trial, belimumab demonstrated enhanced renal outcomes, achieving higher rates of primary efficacy and complete renal response compared to standard therapy alone. Both clinical and real-world data affirm its advantages in managing proteinuria and maintaining renal function. The REGENCY trial showed that obinutuzumab notably increased complete renal response rates by week 76 and facilitated lower prednisone doses. Nonetheless, variations in treatment responses and the risk of adverse events, especially infections, must be taken into account.

Conclusion: Belimumab and obinutuzumab mark significant progress in the treatment of lupus nephritis, enhancing renal responses and potentially decreasing proteinuria and glucocorticoid use. The differences in trial designs pose challenges for direct comparisons between these treatments. Additional long-term studies are necessary to determine the best patient selection, treatment combinations, response durability, and cost-effectiveness.

Keywords: Lupus nephritis, Belimumab, Obinutuzumab

ICOH 118

Perceptions and Concerns Regarding Flood Associated Infectious Diseases Among Residents of Flood-Prone Areas in Mangaluru, Karnataka : A Qualitative Study.

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Background: Flooding is a growing global public health concern associated with deaths, injuries, water and vector-borne infections, gastrointestinal illness, and psychological distress. In India, floods affect an average of 7.38 million hectares annually. Exploring resident's perceptions and concerns regarding flood-related health risks can help identify gaps in risk awareness, preventive practices, and health communication, thereby informing context-specific preparedness and public health interventions. Objective: To explore the perceptions and concerns regarding health risks associated with flooding in urban flood-prone areas of Mangaluru.

Methods: A qualitative study was conducted among five purposively selected residents of flood-prone areas of Mangaluru between 29 September and 07 October 2026. Data were collected using a semi-structured interview guide. Data saturation was assessed, reflexivity was maintained, and transcripts were coded by a trained researcher using QDA Miner Lite version 3.0.9.

Results: Five themes emerged from the interviews. Recurrent flooding was perceived as a normalized environmental event, with participants describing flooding as an annual occurrence that had become part of everyday life. One participant reflected, "I've been living in this area for 26 years now. From the past 15 years there is flood every year, but over the past 10 years, it has become an annual occurrence." Perceptions of health risks associated with flood exposure reflected low perceived personal susceptibility, "I haven't fallen sick because of the flooding so far. I've never had a fever or any other illness related to it, so I don't really have any fear of getting diseases". flooding as a household and livelihood burden, community coping and protective practices, gaps in health communication and institutional response were also reported.

Conclusion: Repeated flood exposure was found to diminish perceived vulnerability to infection by normalizing the hazard. Consequently, integrating targeted health communication with flood-mitigation strategies is critical to enhancing public preparedness and driving preventative behaviours.

Keywords: Urban flooding, health-risk perception, infectious diseases, qualitative research, health communication.

ICOH 119

Lived Experience of Snakebite Survivors in Dakshina Kannada: A Phenomenological Study

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Background: Snakebite is not only a physical health event but can also cause emotional distress, including fear, anxiety and uncertainty. Understanding survivors lived experiences is important for improving snakebite management and prevention.

Objective: To explore the lived experiences of snakebite survivors, including physical and emotional responses, treatment-seeking practices, previous exposure, effects on daily life and perceptions regarding prevention.

Methods: A qualitative phenomenological study was conducted among six snakebite survivors identified through casualty records of Taluk Hospital, Puttur, Dakshina Kannada. The participants included four males and two females. Telephonic in-depth interviews were conducted using a semi-structured interview guide. Interviews were translated into English and analyzed thematically. Participant identities were protected using unique codes.

Results: Participants described snakebite as a sudden and frightening experience, with fear, anxiety and shock as prominent emotional responses. Physical manifestations included bleeding, swelling, black discoloration, weakness and drowsiness, although some reported no symptoms. Treatment-seeking included hospital care, first-aid measures, family or community advice and traditional healing practices. Previous personal, family and community experiences influenced perceptions. Preventive measures included checking surroundings, maintaining cleanliness, avoiding contact with snakes and reducing night-time exposure. Some participants perceived snakebite as unpredictable despite precautions. While several reported minimal lasting effects, others described persistent memories, physical marks and behavioral changes.

Conclusion: Snakebite experiences extend beyond physical symptoms to include emotional distress and behavioral changes. Prevention efforts should promote timely medical care, community awareness, practical safety measures and attention to survivors' emotional well-being.

Keywords: Snakebite, Lived experience, Fear, Anxiety, Survivors

ICOH 120

Burden of non-communicable diseases among elderly population in rural areas of Dakshina Kannada

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Background: Non-communicable diseases (NCDs) are a major cause of morbidity among older adults and pose an increasing public health burden, particularly in rural communities. Understanding the burden and associated socio-demographic factors is essential for strengthening preventive and primary healthcare services.

Objectives: To estimate the prevalence of NCDs among the elderly population in rural areas of Dakshina Kannada, and to determine the association between socio-demographic factors and the presence of NCDs among them.

Methods: A community-based cross-sectional study was conducted among elderly individuals aged 60 years and above residing in a rural village of Dakshina Kannada. Using a line list obtained from the Gram Panchayat (N=258), a complete enumeration was carried out. Data were collected by field investigators through house-to-house interviews. Association between socio-demographic factors and NCDs was assessed using unadjusted and adjusted odds ratios from multiple logistic regression. A p-value <0.05 was considered statistically significant.

Results: Among the 258 elderly participants, aged 60 years and above, 50.4% were female. The prevalence of self-reported NCDs was 57.0% (95% CI: 50.9–63.0%). Single morbidity was reported by 38.75% (n=100), while multimorbidity (≥2 conditions) was present in 18.21% (n=47). Among participants with NCDs (n=147), hypertension was the most commonly reported condition (68.02%), followed by diabetes mellitus (31.29%), comorbidity of hypertension and diabetes (22.45%), and musculoskeletal disorders (9.52%). Multivariable logistic regression, adjusted for age, sex, marital status, education, and occupation, showed that homemakers (aOR=2.41, 95% CI: 1.10–5.28; p=0.028) and retired/dependent individuals (aOR=2.14, 95% CI: 1.01–4.52; p=0.046) had significantly greater odds of having an NCD compared with those engaged in agriculture.

Conclusion: More than half of the rural elderly population suffers from at least one NCD, with hypertension and diabetes being predominant. Strengthening regular NCD screening, promotion of physical activity, and integration of NCD care into primary health services for the elderly are recommended.

Keywords: Non-communicable diseases, Elderly, Prevalence, Multimorbidity, Rural health

ICOH 121

Magnesium and Vitamin D Status and Practices Among Fibromyalgia Patients in Dakshina Kannada: A Mixed-Methods Study

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Background: Fibromyalgia Syndrome (FMS) is a debilitating musculoskeletal disorder characterized by widespread non-inflammatory pain, severe fatigue, and cognitive dysfunction. Sleep disturbances affect up to 90% of FMS cohorts, significantly driving disease severity via bidirectional pain pathways. Biomolecular systems highlight micronutrients like magnesium and vitamin D as key clinical modulators influencing central sensitization and serotonin-driven sleep regulation. Despite high solar levels in Southern India, widespread vitamin D deficiencies persist alongside unrecognized regional gaps in patient nutrition profiles.

Objectives: This study aims to evaluate the integrated associations between serum micronutrient status (Magnesium and Vitamin D), patient health literacy, sleep quality, and overall disease burden among FMS patients in Dakshina Kannada.

Methodology: Employing a three-phase sequential explanatory mixed-methods framework (QUAN → QUAL) at a tertiary healthcare center in Mangaluru, Phase I will focus on designing and validating a custom, bilingual (English-Kannada) Knowledge, Attitude, and Practice (KAP) micronutrient questionnaire. Phase II will deploy a hospital-based cross-sectional analytical design (n=100) utilizing the Revised Fibromyalgia Impact Questionnaire (FIQR) for clinical burden, the Pittsburgh Sleep Quality Index (PSQI) for sleep metrics, the validated KAP tool, and automated laboratory biochemical profiling of serum magnesium and 25-hydroxyvitamin D. Moving sequentially, Phase III will utilize descriptive phenomenology through semi-structured in-depth interviews (n=12–15) to comprehensively explore patient-lived experiences and systemic socio-cultural barriers limiting dietary changes.
Expected Outcomes: The investigation expects to model how integrated behavioral practices and objective serum thresholds directly predict functional sleep quality and overall FMS symptom intensity. These findings will establish the foundation for scalable public health intervention strategies, localized nutritional counseling frameworks, and targeted patient-education modules within the Indian clinical landscape.

Keywords: Fibromyalgia; Mixed-Methods; Magnesium; Vitamin D; Sleep Quality; Knowledge, Attitude, and Practice (KAP).

ICOH 122

Hypertension and its determinants among coastal fisherwomen: A cross-sectional study in Southern district of Keralam

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Introduction: Hypertension is recognized as the leading modifiable risk factor for cardiovascular diseases, stroke, and chronic kidney disease globally. The state of Keralam currently bears a hypertension burden that significantly outpaces national averages (47.6% vs 35.5%). Fishing communities are highly vulnerable to non-communicable diseases (NCDs), particularly hypertension. Within this marginalized ecosystem, fisherwomen constitute a substantial portion of the workforce, bearing the severe dual burden of managing the household and engaging in labor-intensive post-harvest activities. Understanding the localized drivers of hypertension in this specific occupational group is essential for designing effective, culturally sensitive health interventions.

Objectives: To determine the prevalence of hypertension and its determinants among the fisherwomen in Southern district of Keralam.

Methodology: A community-based cross-sectional survey was conducted among the fisherwomen population in a selected Southern district of Keralam in 2024. We collected and analysed details from 492 fisherwomen aged 31–75 years. A multi-stage cluster sampling was used for the study. The STEP-1 and STEP-2 of World Health Organization (WHO) STEPs tool for NCD surveillance was used for data collection. Data analysis was performed using jamovi version 2.6.44.

Results: The median age of the participants was 56 years (range: 31-75). None of the participants reported ever use of tobacco products and alcohol and all of them were physically active. The prevalence of hypertension was 38.2% (95% CI: 33.9-42.4). Significant risk factors included being diabetic (OR: 2, 95% CI: 1.24 3.49), using firewood as cooking fuel (OR: 1.8, 95% CI: 1.07-3.05) and having elevated BMI (OR: 1.6, 95% CI: 1.09-2.39).

Conclusion: Nearly two-fifths (38.2%) of fisherwomen had hypertension. Metabolic and environmental risk factors heavily drive hypertension in this marginalized workforce. Regular screenings, health education and follow-ups are important to detect hypertension and manage related risk factors effectively in this community.

Keywords: Fisherwomen, Hypertension, Keralam

PROJECT One Health™

Theme 9

Digital Health, AI, Modeling & Health Systems Strengthening

ICOH 123

Harnessing India's National Digital Livestock Mission for AI-Driven Predictive Disease Surveillance: A One Health Approach

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Background: India's National Digital Livestock Mission, through the Bharat Pashudhan App and individual animal identification under Pashu Aadhaar, has created an unprecedented digital footprint for millions of livestock, capturing breed, location, vaccination history, movement, and health records. Despite this scale, the data currently serves largely administrative purposes, and its potential for predictive disease intelligence remains almost entirely untapped.

Objective: This study proposes an artificial intelligence and machine learning framework that layers predictive analytics onto NDLM data to enable early, animal-level forecasting of infectious disease risk and outbreak spread, strengthening India's One Health surveillance architecture.

Methodology: The proposed model integrates longitudinal animal health records, vaccination status, herd movement patterns, and geo-tagged location data from the Bharat Pashudhan platform. Machine learning algorithms, such as gradient-boosted classifiers and spatiotemporal clustering models, would identify emerging risk patterns, flag anomalous morbidity clusters, and predict likely transmission corridors along livestock movement and trade routes. Outputs would feed a district-level dashboard for veterinary officers, enabling pre-emptive intervention rather than reactive response.

Expected Outcome: By transforming an existing administrative dataset into a real-time predictive surveillance tool, this approach could reduce detection lag for zoonotic and transboundary diseases, optimise resource allocation for vaccination and quarantine drives, and build evidence linking livestock movement to spillover risk at the human-animal-environment interface.

One Health Relevance: This model requires no new data infrastructure, only analytical integration of a system India is already building at a national scale, making it feasible for near-term implementation. It bridges veterinary epidemiology, data science, and public health policy, offering a scalable, cost-effective surveillance tool tailored to India's livestock demographic positioning.

Keywords: One Health Surveillance, National Digital Livestock Mission (NDLM), Artificial Intelligence / Machine Learning, Predictive Disease Modelling, Zoonotic Disease Outbreak Prediction

ICOH 124

AI-Driven Quantification of Siddha Udal Thegi and Thole Noigal Using SIAscopy and Skin Biophysical Sensors: A Neuro-Symbolic Diagnostic Framework

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Background: Classical Siddha diagnostics (Noi Nadal, Ennvagai Thervu) evaluate cutaneous traits (Thol Gunangal) to assess Udal Thegi (constitution: Vatham, Pitham, Kapham) and classify Thole Noigal (dermatological disorders). Spectrophotometric Intracutaneous Analysis (SIAscopy) non-invasively maps sub-surface chromophores down to 2.0mm depth, enabling optical quantification of traditional diagnostic parameters.

Objectives: To construct a Neuro-Symbolic AI framework fusing 5-channel SIAgraph parameters, surface thermography, and hydration metrics with classical Siddha textual logic for objective Udal Thegi profiling, pathology triaging, and digital disease surveillance aligned with the WHO Global Strategy on Digital Health.

Methodology: To digitalize Siddha Udal Thegi profiling and triage Thole Noigal subtypes, multimodal biophysical data—comprising 5-channel SIAgraphs (Melanin, Dermal Melanin, Hemoglobin, Collagen Displacement), infrared surface thermography (ΔT), and electrical hydration indices—was collected and mapped to Tridosha parameters: Vatham (collagen displacement variance, dryness), Pitham (dermal hyper-vascularity, hyperthermia with $\Delta T \geq 1.5°C$), and Kapham (uniform collagen backscattering, high hydration). A dual neuro-symbolic architecture, combining a neural vision backbone for pixel-level sub-surface analysis with a symbolic Siddha Knowledge Graph enforcing explicit Noi Nadal clinical rules, was developed to process the data, generating Udal Thegi percentage vectors (V:P:K) and NAMASTE portal-compliant outputs aligned with the WHO Traditional Medicine Strategy.

Expected Results: High clinical concordance with expert Siddha evaluation is anticipated. Embedding explicit medical logic replaces black-box feature rankings, enabling precise differentiation between inflammatory lesions (e.g., Karappan, Kuttam) and hyperpigmentary states for actionable risk scoring.

Conclusion: Unifying optical biophysics, surface thermodynamics, and Neuro-Symbolic AI with Noi Nadal principles provides a scalable, medically grounded tool for epidemiological surveillance, supporting the WHO One Health Joint Plan of Action.

Keywords: Health Informatics, Neuro-Symbolic AI, Spectrophotometric Intracutaneous Analysis (SIAscopy), Udal Thegi, WHO Global Strategy on Digital Health.

ICOH 125

Closing the Coverage Gap: Health Insurance, Financial Protection, and the Challenges of Universal Health Coverage in Uttar Pradesh

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Publicly funded health insurance schemes have become a tool for reducing the financial burden on the vulnerable population. This field-based study employs the Inverse probability-weighted regression approach (quasi-experimental) to examine the impact of Pradhan Mantri Jan Arogya Yojana (PMJAY) health card usage on out-of-pocket spending in Uttar Pradesh, India. Furthermore, it utilizes descriptive statistics and narrative to explore the implementation barriers and satisfaction with the scheme. The results demonstrate that the scheme significantly reduces the OOP for PMJAY card users, and users are satisfied with the scheme overall. However, the scheme does not provide the promised coverage of up to 5 lakh rupees, leaving users dissatisfied with the financial aspects of the scheme. Many beneficiaries failed to utilize the scheme due to a lack of awareness. Local stakeholders and hospitals should be held accountable for ensuring the awareness and financial protection of the beneficiaries.

Keywords: Narrative, PMJAY, Impact evaluation, India, IPWRA, Satisfaction

ICOH 126

Health System Preparedness for One Health in South Asia: A Scoping Review

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Background: Zoonotic diseases pose a growing threat to health systems in South Asia, where close human–animal–environment interactions increase the risk of disease emergence. One Health (OH) approach offers a multisectoral framework to strengthen health system preparedness, yet evidence on its implementation across the region remains less documented, limiting a comprehensive understanding of its implementation. Therefore, this review aims to examine how the OH approach contributes to strengthening health system preparedness in South Asia, with a focus on surveillance capacity, laboratory and diagnostic capacity, workforce and training, intersectoral collaboration, governance and policy, financing, and data and digital health systems.

Methods: A scoping review was conducted according to PRISMA-ScR guidelines. PubMed, Embase, and Scopus databases were searched without publication-year restrictions. English-

language studies from the eight South Asian countries were considered. Studies were selected using predefined PECOTS-based criteria, followed by title/abstract and full-text screening. Data were extracted using a standardized charting form and analyzed. **Results**: A total of 783 records were identified. After duplicate removal, 508 records were screened, and 60 full texts were assessed. Thirty-three studies were finally included which fulfilled inclusion and exclusion criteria Most studies were from India and Bangladesh. Studies described One Health activities, including integrated surveillance, outbreak preparedness, laboratory strengthening, workforce training, multisectoral coordination, policy development, and digital reporting. Common gaps included fragmented surveillance, limited data sharing, uneven laboratory capacity, workforce shortages, weak intersectoral coordination, gaps in policy implementation, and limited sustainable financing.

Conclusions: One Health approaches are being used to strengthen health-system preparedness in South Asia, but implementation remains uneven. Strengthening surveillance and data sharing, laboratory systems, workforce capacity, intersectoral coordination, supportive policies, and sustainable financing is needed to improve preparedness for zoonotic and emerging health threats.

Keywords: One Health, South Asia, India, Health system preparedness

ICOH 127

Artificial intelligence-enabled data integration in intensive care nursing: a narrative review of applications, barriers and the evolving role of the nurse practitioner

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Background: Intensive care units (ICUs) generate dense, high-velocity, multimodal data from bedside monitors, ventilators, infusion pumps, laboratory systems, and electronic health records (EHRs). Artificial intelligence (AI) is increasingly proposed as the mechanism by which this fragmented data can be fused into timely, actionable information at the bedside, yet its translation into everyday nursing workflow remains uneven.

Objective: To synthesize contemporary evidence on AI-enabled data integration in ICU nursing practice and examine its implications for critical care Nurse Practitioners (NPs).

Methods: A narrative review of literature published between 2020 and 2026 was conducted across PubMed/MEDLINE, Scopus, Web of Science, and preprint servers, focused on AI applications in critical care nursing and informatics.

Findings: AI-enabled data integration clusters around four domains: bedside physiological data fusion and early-warning generation; EHR interoperability for predictive analytics; explainable clinical decision support; and workflow, documentation, and alarm-management automation. Discrimination performance for early-warning and sepsis-prediction models is frequently strong, but calibration, external validation, and human-factors testing are reported less consistently. Adoption is constrained by device-vendor interoperability gaps, alarm fatigue, limited explainability, and unresolved accountability. Critical care NPs are positioned to translate integrated outputs into actionable decisions and to serve as clinical co-designers of these systems.

Conclusion: AI-enabled data integration holds substantial promise for augmenting ICU nursing surveillance and decision-making, but safe adoption depends on nurse-informed design, interoperable infrastructure, explainable outputs, and an expanded informatics role for the critical care Nurse Practitioner.

Keywords: Artificial intelligence, data integration, intensive care unit, critical care nursing, nurse practitioner

ICOH 128

Design and Validation of an IoT-Enabled Smart Chair for Real-Time Sitting Posture Monitoring: A One Health Approach to Technology and Data Integration

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Background: Prolonged sedentary behaviour is a major contributor to posture-related musculoskeletal disorders and remains a growing occupational and public health concern in technology-driven, desk-bound lifestyles. Viewed through a One Health lens, this reflects the deeper interdependence between human physiological health, the built and technological environment people inhabit, and the ergonomic design of everyday workplace tools. This study designed, developed, and experimentally validated an IoT-enabled smart chair for real-time sitting posture monitoring, integrating pressure sensing with machine learning to support data-driven, environment-integrated ergonomic assessment.

Methods: A 15-sensor force-sensing resistor (FSR) array (9 seat sensors, 6 backrest sensors) was embedded into a custom-built ergonomic chair to capture pelvic load distribution and spinal alignment across eight standardized sitting postures. Sensor data from 100 participants, recruited via stratified purposive sampling across gender, age, and weight categories, were calibrated using polynomial regression (accuracy: 96.2%) and analysed using Random Forest,

Extra Trees, and XGBoost models for body-weight prediction and posture classification, validated against a 50-participant control group.

Results: The Extra Trees model achieved the strongest predictive performance (R^2 approaching 0.999; RMSE < 0.52 kg) for both male and female participants, with low bias and homoscedastic residuals confirming robust generalisability. Multi-class posture classification across the eight-posture framework achieved an overall accuracy of 93.5%, with minimal misclassification confined to biomechanically similar postures (e.g., forward bending vs. slouching).

Conclusion: The proposed IoT-enabled smart chair demonstrates accurate, interpretable, real-time posture monitoring, embodying a One Health approach to occupational well-being by bridging human physiology, technology, and environment. It holds strong potential for ergonomic assessment, workplace health monitoring, rehabilitation, and technology-integrated healthcare, supporting sustainable, data-driven prevention of sedentary-lifestyle-related musculoskeletal disorders.

Keywords: Occupational disorder, sedentary life, Musculoskeletal disorders, Ergonomics.

ICOH 129

Integrative Pan-Cancer Expression Profiling via Scripted Genomic Workflows: Characterising CD47 Dysregulation in TCGA Cohorts

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High-throughput genomics generates complex, multidimensional datasets requiring scalable computational approaches to extract biologically relevant information systematically. In non-communicable diseases (NCDs) such as cancer, systematic analysis across diverse molecular cohorts can facilitate molecular characterisation and candidate biomarker profiling. Standardising multi-cohort transcriptomic analysis remains an important bioinformatic challenge. CD47, an innate immune checkpoint involved in tumour immune evasion through the “don’t eat me” signal, provides a representative candidate biomarker for evaluating such analytical workflows.To demonstrate a reproducible computational workflow for systematic analysis of multi-cohort RNA-sequencing data and its application to pan-cancer profiling of CD47 expression across diverse tumour types. RNA-sequencing data from 12 The Cancer Genome Atlas (TCGA) cohorts (BLCA, BRCA, CESC, CHOL, COAD, ESCA, HNSC, KICH, KIRC, KIRP, LIHC, and LUAD) were analysed using R and the TCGAbiolinks framework. We used a scripted pipeline for data retrieval and preparation, CD47 expression extraction, tumour–normal comparisons, and statistical analysis. Differential expression was assessed

using the Wilcoxon rank-sum test, followed by Benjamini–Hochberg false discovery rate (FDR) correction. CD47 expression demonstrated cancer-type-specific variation across the analysed cohorts. Following FDR correction, significant differential expression between tumour and normal tissue was identified in nine of twelve cohorts: CHOL, HNSC, BRCA, LIHC, KIRP, LUAD, ESCA, KICH, and CESC. The largest observed effect size was in CHOL (log_2FC = 2.26; FDR < 0.001). In LIHC, CD47 expression was significantly higher in tumour than in normal liver tissue (log_2FC = 0.53; FDR = 0.0064). This study demonstrates the utility of scripted computational workflows for systematic analysis of large-scale transcriptomic datasets and comparative molecular profiling across cancer cohorts. The observed pan-cancer variation in CD47 expression provides a framework for investigating candidate immune biomarkers in NCD research and supports further integration of genomic data with molecular and clinical characteristics.

Keywords: Data integration; computational genomics; bioinformatic workflow; TCGAbiolinks; non-communicable diseases; cancer; CD47; immune checkpoint.

ICOH 130

Precision nutrition approaches to cardiovascular disease risk in the Indian population

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Background: Cardiovascular disease (CVD) is the leading cause of mortality in India, accounting for approximately 31% of all deaths, with prevalence exceeding 54 million cases. Emerging artificial intelligence (AI) and machine learning (ML) tools offer novel approaches for CVD risk prediction and precision nutrition interventions.

Objective: The study aims to evaluate how precision nutrition technologies incorporating AI and ML assess CVD risk factors and guide personalized dietary interventions in the Indian population.

Methodology: A narrative review was conducted using PubMed, Google Scholar, and Scopus databases (2021–2026). Studies examining precision nutrition frameworks, AI/ML-based CVD risk prediction models, novel biomarkers, and digital nutrition tools in Indian and South Asian populations were synthesized.

Result: The studies have shown AI-enhanced models demonstrating area under the curve (AUC) values of 0.82–0.91 for CVD risk prediction, representing 10–18% improvement over conventional scores like Framingham Risk Score. In South Asian cohorts, ML algorithms

predicted failure to achieve glycemic control with 73% precision and 67% sensitivity when targeting the top 50% risk category. Conventional models frequently underestimate risk in Indian populations due to genetic predisposition, earlier disease onset, and unique metabolic phenotypes. Novel biomarkers including lipoprotein(a), apolipoproteins, and inflammatory markers enhance risk stratification beyond traditional lipid profiles.

Conclusion: Precision nutrition integrating AI/ML technologies shows promise for improving CVD risk assessment and personalized dietary guidance in Indian populations. However, current frameworks require external validation, standardized calibration reporting, and assessment of algorithmic fairness before widespread clinical implementation. Digital nutrition tools support self-monitoring for diabetes and weight management but face adoption barriers related to accuracy, accessibility, and affordability. Population-specific prediction models incorporating novel biomarkers and socio-cultural factors are needed to address the underestimation of CVD burden by conventional risk scores in India.

Keywords: Cardiovascular Disease, Artificial intelligence, Machine Learning, Digital nutrition, Interventions

ICOH 131

Beyond the Triple Burden: Interconnected Morbidity, Behavioural Risks, and Healthcare Inaccessibility among Tribal Communities in Western Odisha

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Background: Tribal communities in India experience overlapping health challenges shaped by environmental exposures, behavioural risks, socioeconomic disadvantage, and limited healthcare access.

Objectives: To assess morbidity patterns, addiction, healthcare accessibility barriers, and treatment-seeking behaviour among tribal adults in Western Odisha.

Methods: A community-based cross-sectional study was conducted among 423 adults belonging to the Kotia Kondh and Dongria Kondh communities in selected tribal villages. Data were collected using structured interviews and clinical assessments with a pre-tested questionnaire. Descriptive statistics and appropriate tests of association were used to analyse morbidity patterns, behavioural risks, and healthcare utilisation.

Results: Overall, 82.5% of participants reported at least one morbidity. Respiratory and cold-related symptoms affected 50.6%, while hypertension was observed in 35.7%. Addiction was

reported by 67.6%, with tobacco chewing being the most common form (22.9%). Addiction was significantly associated with respiratory symptoms. Healthcare utilisation was low, with 62.2% not seeking treatment. Financial constraints were the most frequently reported specific barrier (38.5%), followed by lack of available services (14.7%) and distance (12.5%). Furthermore, 98.1% reported living more than five kilometres from the nearest healthcare facility. Education and health insurance coverage were significantly associated with treatment-seeking behaviour, highlighting socioeconomic influences on healthcare utilisation.

Conclusion: The coexistence of respiratory symptoms, non-communicable diseases, behavioural risks, and healthcare accessibility barriers reflects the complex health challenges faced by tribal communities. Strengthening primary healthcare, improving geographical accessibility, promoting tobacco cessation, and integrating preventive screening with culturally appropriate health education are essential. Incorporating environmental health assessments and community participation into future interventions could support a broader One Health-informed approach to improving tribal health equity.

Keywords: One Health; Tribal Health; Morbidity; Addiction; Healthcare Accessibility; Health Equity.

ICOH 132

Integrating AYUSH Facilities into Bio-Medical Waste Governance: A Policy Analysis of the 2026 Amendment and a District Implementation Roadmap

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Background: Proper disposal of biomedical waste is essential to prevent infections and keep communities safe. With increasing numbers of AYUSH centers in India, there has been an increase in production of clinical and pharmaceutical waste. Though the national waste regulations apply to all bedded centers, there has been poor regulation of AYUSH centers in the past. On 17 April 2026, Ministry of Environment, Forest and Climate Change introduced amendments to the Bio-Medical Waste Management Rules 2016 (G.S.R. 293(E)), including representation of AYUSH representatives on state and district level monitoring committees.

Objective: The present study provides an effective compliance plan for AYUSH centers after analyzing the impact of the amendment made in 2026.

Methodology: The 2016 regulations governing bio-medical waste and the 2026 amendment were reviewed, as well as the literature concerning traditional medicine practices, waste segregation practices and management and its relation to treatment plants.

Key Findings: There are specific wastes generated in the case of AYUSH centers. These include sharp wastes, blood-soiled wastes such as dressings in parasurgical interventions such as Ksharasutra and Raktamokshana and a number of herbal extracts. Independent clinics fail to have staff trained in waste segregation and have no association with authorized waste collectors. This may be solved by having AYUSH officials in district level committees.

Conclusion: The 2026 amendment brings closure to an old governance loophole. The presence of AYUSH officials in district committees turns the policy into a reality as waste is handled safely before it is discharged into the environment.

Keywords: Bio-Medical Waste Management; AYUSH; Environmental Governance; Health Policy; Compliance Framework

ICOH 133

A Soft-Set Approach Optimizing Nurse-Resource Allocation in Hospitals: A Computational Framework Mitigating Burnout

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Introduction: Burnout remains a formidable challenge among global nurse practitioners, stemming from futile workloads, inadequate staffing, and subpar management strategies. These issues not only erode nurses' performance and well-being but also negatively affect patient safety and care outcomes. Equitable resource allocation is therefore essential to balance workloads, reduce stress, enhance job satisfaction, and improve overall hospital efficiency. Traditional planning methods, however, often fail to address the stochastic and dynamic complexities inherent in hospital operations. To overcome these limitations, this study introduces a computational framework based on a soft-set approach, designed to optimize nurse allocation. The framework holds copious potential to balance workloads, prioritize patient care, and bolster operational efficiency in hospitals.

Method: A mixed-methods study design was adopted. Phase I: Qualitative assessment using the semi-structured Delphi method with 6 nurses and the Nurse Optimization and Wellness Questionnaire (NOWQ-50) to explore burnout factors, workload, skill utilization, task diversity, emotional exhaustion, and job satisfaction. Phase II: A quantitative approach developed and validated the Nurse Wellness Scale (NWS) for 60 nurses working in a hospital. The Overall

Nurse Wellness Score (ONWS) has been referred to as a wellness indicator for individual nurses. Phase III: Computational modelling was introduced for piloting, following the Integrated Nurse Allocation Model (INAM) to allocate 60 nurses caring for 180 patients across three shifts. Organizational input parameters included shift hours, weekly-offs, departmental assignments, nurse-patient ratios, nurse ranking, and patient priorities. The following parameters were incorporated to generate an automated weekly roster for nurses, developed in Python in nurse integrating the application of soft-set for optimization and visualization.

Results: The nurses reported average wellness (ONWS=2.3). The optimized allocation model effectively distributed nurses across shifts, reducing workload imbalance and enhancing nurse wellness up to 33% as predicted. Statistical analysis showed significant correlations between workload and burnout (r=0.65) and between task diversity and emotional exhaustion (r=-0.58). The regression revealed workload as the strongest predictor of job satisfaction (R^2=0.89, p<0.001).

Discussion: The study demonstrates the feasibility of computational tools for dynamic nurse resource management. INAM addressed workload disparities, nurse wellness, and patient care priorities, offering adaptive, evidence-based solutions. Findings highlight the need for tailored strategies in high-demand shifts and establish sustainable frameworks for holistic healthcare resource optimization.

Keywords: Nurse Resource Allocation; Soft Set Theory; Burnout Mitigation; Nurse Wellness; Healthcare Management; Computational Modelling; Burnout

ICOH 134

Content Validation of a Nutrition Literacy and Food Safety Assessment Tool for College Students

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Background: Nutrition literacy and food safety knowledge are important for enabling individuals to make informed food choices and adopt safe food practices. With changing food habits and the increasing availability of packaged, processed, and ready-to-eat foods, college students are making more food-related decisions independently than ever before. **Objective:** This study aimed to validate a nutrition literacy and food safety assessment tool for college students.

Methods: A tool was developed based on relevant literature related to nutrition literacy, food safety, and the understanding and interpretation of food and nutrition information. The preliminary questionnaire consisted of 40 items. Face validity was assessed by four randomly

selected lay experts from different academic disciplines and one additional expert. The questionnaire was evaluated for importance, ambiguity, and simplicity. Feedback from each expert was reviewed individually, and relevant changes were incorporated. Items were reframed, corrected, and clarified wherever required to improve comprehensibility, simplicity, and appropriateness. Content validity was subsequently assessed by five experts with 2-7 years of experience, respectively, along with one additional expert. The experts assessed the relevance and usefulness of the items, and modifications were made based on their recommendations. The Item-level Content Validity Index (I-CVI), Scale-level Content Validity Index based on the average method (S-CVI/Ave), and universal agreement method (S-CVI/UA) were calculated.

Results: The overall Scale-level Face Validity Index based on universal agreement (S-FVI/UA) was 0.97. Content validation yielded an overall S-CVI/Ave of 0.91. Following expert review, the questionnaire was revised through appropriate reframing, correction, and clarification of items. Finally, 38 of the initial 40 questions were retained with appropriate corrections and modifications. Conclusion: The developed tool demonstrated satisfactory face and content validity, with an S-FVI/UA of 0.97 and an S-CVI/Ave of 0.91, respectively, for assessing nutrition literacy and food safety among college students. Further assessment of reliability and other psychometric properties is recommended before wider application.

Keywords: Nutrition literacy; Food safety; College students; Face validity; Content validity

ICOH 135

From Risk Mapping to Care-Seeking: A Spatial Prediction of Snakebite Risk and Exploration of Healthcare-Seeking Pathways in Rural Odisha

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Background: Snakebite is a neglected tropical disease causing an estimated 5.4 million bites and 138,000 deaths worldwide each year. India carries the highest burden, and about 75% of deaths occur before the victim reaches a hospital. The lack of GIS-based risk prediction models hinders identification of high-risk zones and resource allocation.

Objectives: To analyse geographic patterns of snakebite and develop a risk prediction model using geospatial, climatic and socio-demographic data, and to explore care-seeking pathways, delays and barriers among snakebite victims.

Methods: A mixed-method study was conducted in Tigiria Block, Cuttack, Odisha. Snakebite cases (n = 720) recorded at the Sub-Divisional Hospital, Athagarh, during 2020–2024 were

analysed. Landsat-8 imagery was processed to derive Normalized Difference Vegetation Index (NDVI), Land Surface Temperature (LST), proximity to river and elevation, which were integrated in GIS to predict risk zones. In-depth interviews with victims and focus group discussions with ASHAs, community members, health workers and family members explored care-seeking.

Results: Males accounted for 67.5% of cases and females 32.5%. The 31–60-year age group was most affected (63.8%), followed by 18–30 years (19.3%), above 60 years (9.7%) and below 18 years (7.1%). Cases peaked in 2022, with most bites occurring during July–September. Most cases occurred within an LST range of 27–32°C and were concentrated in croplands and backyards. The model classified the block into low-, medium- and high-risk zones. Qualitatively, victims commonly visited traditional healers first, seeking hospital care only when the condition worsened.

Conclusion: Remote sensing and GIS-based risk mapping can guide targeted interventions and resource allocation for snakebite. Improved healthcare access, public awareness and timely treatment are urgently needed to reduce snakebite mortality in rural Odisha.

Keywords: Snakebite, Remote sensing, Risk zone prediction, NDVI, Land surface temperature

ICOH 136

Analysis of GPX8-Associated Redox Adaptation in Cancer Persister States

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Targeted cancer therapy can fail when persister populations survive through reversible, non-genetic tolerance states. Oxidative-stress adaptation may contribute to survival during treatment. Human GPX8, an endoplasmic reticulum-associated peroxidase involved in peroxide control and annotated to KEGG glutathione metabolism, was investigated as a candidate contributor to drug-tolerant persister (DTP) states in EGFR-mutant lung cancer. Public RNA-sequencing data from osimertinib-treated PC9 DTP cells versus vehicle controls were analysed using Python packages. Differential expression and KEGG/GO enrichment were integrated with STRING networks, GPx-family sequence and structural comparisons, phylogenetic analysis, and molecular docking. Clinical analyses examined TCGA/GTEx mRNA expression, CPTAC protein expression, and Kaplan–Meier survival associations. Analysis identified 4,206 differentially expressed genes (2,608 upregulated; 1,598 downregulated), using adjusted $p<0.05$ and $|\log_2 FC|\geq 1$. KEGG enrichment of dysregulated genes highlighted cell-cycle and DNA-replication pathways, while GO analysis identified cell-

division and chromosome-segregation processes. GPX8 was upregulated, with $\log_2$FC=+1.19 and adjusted p=1.11×10^{-38}. TCGA patient datasets showed higher median GPX8 mRNA expression (483 tumours; 347 non-tumour samples) and protein expression (111 samples per group). Exploratory Kaplan–Meier survival analysis (n=1,411) associated higher GPX8 expression with poorer survival (HR=1.21, 95% CI 1.05–1.41; log-rank p=0.0098). GPx-family comparisons identified conserved residues and partial structural overlap among family members, alongside protein-specific differences. Among the selected compounds docked against GPX8, luteolin scored −6.8 kcal/mol. Its top pose occupied a neighbouring pocket, while I22 produced alternative poses near the catalytic region. Together, the cell-line and patient associations provide a rationale for investigating GPX8's clinical relevance alongside its possible contribution to cancer drug persistence.

Keywords: GPX8; drug-tolerant persister cells; EGFR-mutant lung cancer; oxidative stress; glutathione metabolism

ICOH 137

From Intervention to Continuity: Building a One Health Evidence System for Community Dogs in India

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QRB

Estimates of India's stray dog population vary widely. The 2019 Government Livestock Census counted 15.3 million stray dogs, while the 2021 Mars State of Pet Homelessness Index estimated 62 million street/stray dogs. In India, advocates for Animal Birth Control and sterilisation cite a 1992 US estimate suggesting that one unsterilised female dog and her offspring could produce 67,000 dogs within six years, a figure that was later described as a "mathematical exercise used to make a point, not a biological reality". However, a five-year study in West Bengal that followed 364 pups found that about 295 had died or disappeared, while only 69 survived to reproductive age, with their actual reproductive contribution unknown. This vast difference between mathematical projections and ground reality is critical to the effective management of stray dogs in India. Besides population dynamics, vaccination and sterilisation numbers matter. Yet this information is fragmented across government, municipalities, veterinary and animal-welfare groups, and communities, with no continuous history of individual animals or local populations, including which animals disappear, die or move, and how many puppies are born and survive. This led to CAB, an initiative combining three approaches: the Community Animal Record (CAR), a digital tool for building longitudinal animal and population histories; Buddies. Not Baddies, a behaviour change communication effort reframing perceptions of stray dogs to support safety and coexistence; and Amazing

Indies, which documents India's rich but fading native dog heritage. As an initial test, 100 documented animal-related events across India from 2020 to 2026 were structured into CAR-compatible records, revealing available evidence and gaps in longitudinal histories. CAB will next test 500 animal records and 100 community surveys, examining whether animal histories combined with human and environmental observations can strengthen One Health evidence for better planning, safer coexistence and preservation of native dog heritage.

Keywords: Community animals; longitudinal records; animal identification; population management; One Health.

ICOH 138

RNA-based Transthyretin Silencing Therapies in ATTR-CM: Comparative Outcomes of Vutrisiran, Patisiran, and Eplontersen

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Background: Transthyretin amyloid cardiomyopathy (ATTR-CM) is a progressive, life-threatening disorder caused by extracellular deposition of misfolded transthyretin amyloid fibrils in the myocardium. Once considered rare, improved diagnostic recognition has revealed ATTR-CM in approximately 13–16% of elderly patients with heart failure with preserved ejection fraction and contributes to substantial cardiovascular mortality. RNA-based transthyretin silencing therapies have emerged that can substantially reduce circulating transthyretin production. However, comparative evidence regarding their cardiovascular and survival outcomes remains limited.

Methods: Studies evaluating RNA-based transthyretin (TTR) silencing therapies, including the antisense oligonucleotide (ASO) eplontersen and the small interfering RNA (siRNA) agents patisiran and vutrisiran, in patients with ATTR-CM were reviewed. Outcomes of interest included all-cause mortality, recurrent cardiovascular events, and hospitalizations. **Results:** In phase III HELIOS-B, vutrisiran reduced the risk of the composite of cardiovascular mortality and cardiovascular events by 28% over 33–36 months compared with placebo. At

42 months, all-cause mortality was reduced by 36% overall and 39% lower in monotherapy. In a post-hoc cardiac analysis of APOLLO trial, patisiran was associated with a 46% lower risk of cardiovascular hospitalization or mortality. Eplontersen did not significantly reduce cardiovascular mortality or recurrent cardiovascular events in the phase III CARDIO-TTRansform trial, despite substantial TTR suppression.

Conclusions: RNA-based transthyretin silencing therapies show promising but varied cardiovascular outcomes in ATTR-CM. Vutrisiran demonstrated significant reductions in mortality and recurrent cardiovascular events in HELIOS-B, while eplontersen did not significantly reduce the primary cardiovascular outcomes in CARDIO-TTRansform. These findings support TTR silencing as an important treatment strategy in ATTR-CM.

Keywords: Transthyretin amyloid cardiomyopathy (ATTR-CM), RNA interference, Transthyretin silencing, Cardiovascular outcomes, All-cause mortality

ICOH 139

Putting Animal Welfare at the Heart of One Health: From Policy to Practice

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The One Health approach recognises the interconnectedness of human, animal and environmental health. However, animal welfare is often considered alongside these domains rather than as an integral component of One Health. Poor animal welfare can have implications for animal health, public health, livelihoods, food systems and environmental sustainability, making its integration into One Health policy and practice essential. In India, the growing emphasis on One Health provides an important opportunity to strengthen the link between animal welfare, animal health and broader public health and environmental priorities. Yet translating this interconnected approach into practice requires more than technical interventions. It calls for enabling policies, institutional coordination, capacity building, effective implementation mechanisms and meaningful engagement among government, veterinary professionals, communities, researchers and civil society. Drawing on experience across public health, animal welfare policy advocacy, government engagement and capacity-building initiatives in India, this paper examines opportunities and challenges in integrating animal welfare more systematically into One Health frameworks. It highlights the importance of strengthening frontline veterinary and animal-health systems, building capacities of relevant stakeholders, promoting evidence-informed policymaking, and fostering greater coordination across sectors and levels of government. The paper argues that placing animal welfare at the heart of One Health can contribute to more responsive animal-health systems, healthier

communities, sustainable livelihoods and more resilient societies. It proposes a policy-to-practice framework for embedding animal welfare within One Health governance and implementation in India.

Keywords: One Health, Public Health, Animal Health, Policy and Governance, Animal Welfare

ICOH 140

Documented Incidents of Suspected and Confirmed Falsified Anti-Cancer Medicines in India (2022–2025): A Forensic Documentary Review of Product Authentication and Regulatory Responses

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Background: Falsified anti-cancer medicines are a serious concern because they may put patients' health and safety at risk. Reports of such medicines may use terms such as"counterfeit," "falsified," and "not of standard quality" differently. Therefore, it is important to examine the available evidence before deciding how an incident should be classified.

Aim: This study aims to identify and examine reported incidents of suspected or confirmed falsified anti-cancer medicines in India between 1 January 2022 and 31 December 2025. It will focus on product-authentication evidence and the actions taken by regulatory authorities.

Methods: This study will use a retrospective documentary review of publicly available information. Sources will include the Central Drugs Standard Control Organization (CDSCO), state drug-control authorities, government announcements, court records, manufacturer statements, and news reports. News reports will be used to identify possible cases, which will then be checked against original records wherever available. Search terms will include "spurious anti-cancer medicine," "falsified oncology drug," "counterfeit cancer injection," "manufacturer authentication," and "drug seizure." Only incidents involving identifiable anti-cancer medicines in India during the study period will be considered. Duplicate reports of the same incident will be combined. Information on the medicine, batch number, manufacturer, location, investigating authority, laboratory findings, authentication evidence, regulatory action, and legal outcome will be recorded in a structured spreadsheet. Cases will be classified as confirmed falsification, suspected or alleged, not of standard quality only, or unresolved, according to the available evidence. A seizure, arrest, or not-of-standard-quality result alone will not be treated as proof of counterfeiting. Missing information will be recorded as "Not stated in source." Descriptive analysis will be used to summarise the findings.

Expected Contribution: The study may identify gaps in product verification, regulatory reporting, and publicly available investigation records. Its findings may help improve medicine

traceability, regulatory alerts, and patient-safety measures. The results will not be used to estimate the national prevalence of falsified medicines.

Keywords: Falsified medicines; anti-cancer medicines; forensic science; product authentication; regulatory response; patient safety.

ICOH 141

Target Molecular Mechanisms of Allopathic Drugs in Psychiatric Illnesses

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Psychiatric illnesses are complex conditions that affect mental health, emotional regulation, cognitive functions and behavioural responses. The development and progression of these conditions involve several biological mechanisms, including alterations in neurotransmitter activity, neuronal communication, synaptic plasticity, neuroinflammation and intracellular signaling pathways. Allopathic drugs play an important role in managing psychiatric illnesses by regulating neurotransmitter activity and modifying the molecular processes associated with neurological functioning. However, differences in treatment response, adverse effects, long term medication requirements and limited understanding of certain therapeutic mechanisms remain major concerns in psychiatric management. The present review aims to explore the molecular mechanisms through which commonly prescribed allopathic drugs exert their therapeutic effects in psychiatric illnesses, with particular emphasis on neurotransmitter regulation, receptor interactions and intracellular signaling pathways. These drugs primarily influence serotonergic, dopaminergic, noradrenergic and glutamatergic systems, which are involved in regulating mood, attention, cognition and behaviour. In addition to their effects on neurotransmission, certain medications influence neuronal plasticity, neurotrophic factors, oxidative stress and inflammatory responses, suggesting their involvement in multiple biological processes. Understanding these mechanisms is important for identifying the molecular basis of therapeutic action and the factors contributing to variations in treatment outcomes. The review also highlights the significance of receptor selectivity, molecular interactions and downstream signaling pathways in determining drug efficacy and tolerability. Despite considerable advancements in pharmacological treatment, the complex interactions between different molecular pathways continue to present challenges in achieving consistent therapeutic outcomes. A better understanding of these mechanisms may contribute to identifying potential therapeutic targets, improving existing pharmacological approaches and supporting the development of safer and more effective treatment strategies. Overall, this review provides an overview of the molecular

mechanisms underlying allopathic drug action and their relevance to the management of psychiatric illnesses.

Keywords: Psychiatric illnesses, Allopathic drugs, Molecular mechanisms, Neurotransmitters, Receptor interactions, Intracellular signaling pathways, Therapeutic targets.

ICOH 142

Impact of Antimicrobial Stewardship Interventions on Intravenous Antibiotic Utilization in Geriatric Care: A Six-Month Retrospective Before-and-After Study

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Introduction: Older adults are vulnerable to inappropriate antimicrobial use due to multimorbidity, polypharmacy, atypical infection presentations, adverse drug events, and antimicrobial resistance. Appropriate intravenous (IV) antibiotic use requires clinical justification, microbiological evidence, suitable duration, and timely reassessment. This study evaluated changes following an AMR Awareness Week educational intervention.

Objective: To assess changes in IV antibiotic initiation rates and prescribing quality across seven KITES Senior Care centres following an educational session in November 2025.

Methods: This retrospective before-and-after study compared May-October 2025 with December 2025-May 2026. Data were collected from IV antibiotic prescription forms. Initiation rates were calculated per 100 admissions. Indicators included WHO AWaRe classification, duration documentation, CRP/procalcitonin documentation, and microbiological culture timing.

Result: IV antibiotic utilization decreased from 5.9 to 3.9 per 100 admissions. Duration documentation improved from 11/25 to 16/21, and CRP/procalcitonin documentation increased from 6/25 to 10/21. Access-group use changed from 24% to 26%, while Watch-group use increased from 59% to 67%. Culture submission changed from 19/25 to 16/21, while pre-antibiotic cultures decreased from 1/19 to 0/17. Broad-spectrum IV antibiotic use increased from 14/25 to 14/21.

Conclusion: The intervention was associated with reduced IV antibiotic initiation and improved documentation of antibiotic duration and inflammatory markers. Clinical pharmacist review supported standardized prescribing and dose/frequency verification. However, increased Watch-group and broad-spectrum antibiotic use and persistently limited pre-antibiotic culture collection indicate ongoing stewardship gaps. A concurrent change in the Chief Medical Officer (CMO) may also have influenced prescribing patterns.

Keywords: Antimicrobial Stewardship, Intravenous Antibiotic Utilization, WHO AWaRe Classification, Clinical Pharmacist Intervention, Geriatric Care

ICOH 143

From Ventricular Access to CSF Control: Exploring the Potential of MR-Guided Focused Ultrasound for Choroid Plexus Modulation in Pediatric Hydrocephalus

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Pediatric hydrocephalus is commonly managed with shunting or endoscopic procedures, including choroid plexus cauterization (CPC), which aims to reduce CSF production but requires intracranial access. The therapeutic relevance of targeting the choroid plexus is supported by its role in CSF secretion and by the clinical experience with endoscopic CPC. Meanwhile, robotic MR-guided focused ultrasound (MRgFUS) platforms have been developed for precise intervention within the neonatal ventricular system, particularly in intraventricular hemorrhage. This review explores whether MRgFUS could be adapted for a non-invasive approach to choroid plexus modulation and identifies the biological, technical and translational requirements for future investigations.

We conducted a thematic translation review of English language literature published between 2016 and 2026. Literature was sourced from PubMed, Scopus, and Web of Science using terms related to hydrocephalus, choroid plexus CSF production, focused ultrasound, MRgFUS and intraventricular intervention. Diagnostic-only ultrasound studies and records unrelated to CSF dynamics or therapeutic intracranial ultrasound were excluded.

The choroid plexus represents a biologically plausible target because its epithelial transport mechanisms contribute directly to CSF transport. Clinical CPC indicates that deliberate reduction of CP function can influence hydrocephalus management, although outcomes vary with age and underlying etiology. Separately, neonatal MRgFUS platforms have demonstrated submillimeter targeting capability and effective intraventricular clot disruption in brain-mimicking phantoms. A neonatal porcine model has also provided a measurable framework for evaluating ventricular changes following intraventricular interventions. Pediatric MRgFUS experience in other neurological conditions supports technical feasibility, but available evidence remains indirect. However, no eligible study identified in our search directly targeted the choroid plexus with MRgFUS or evaluated ventricular or intracranial-pressure outcomes.

Existing biological, clinical and technical evidence provides a rationale for investigating MRgFUS as a potential non-invasive approach to choroid plexus modulation and its effects on CSf dynamics.

Keywords: Choroid plexus, focused ultrasound, pediatric hydrocephalus, cerebrospinal fluid, MR-guided intervention