



Collection on Global Environmental Health

Research and Best Practices

Volume 2

Abstracts, Narratives and Creative Contents

November 14, 2025

Santa Monica, CA, USA

ISSN Pending

Table of Contents

	<i>P</i>
Needs Assessment in a Rural Community of Bandung, Regency, West Java, Indonesia	3
Mini-Systematic Review of Managing Malaria in Children Under Five in the Kpone-Katamanso Municipal District of Ghana, Africa through Long-Lasting Insecticide-Treated Bed Nets	4
Surveying Congenital Heart Disease: Be Sure to Call Your Mother	5
Inaugural Interdisciplinary Public Health Class at Indonesian Medical School: Student Reflection Survey	6
The Charcoal Kiln Revived by Students and Seniors in Aone, Japan	7
Spiritual Wisdom and Global Action: A Dialogue on Buddhist Teachings and the SDGs	8
Living Together with Nature: Managing Invasive Peafowl for Biodiversity Conservation on Ishigaki Island	9
Hurricane Resilience of Small Community Water Systems in Puerto Rico	10
Working Environment in Japan: Karoshi	11
Veterinary Roles in Achieving Sustainable Livestock	12
Lighting the Way: Roshan Learning Center's Mission to Sustain Refugee Education in Indonesia	13
Development of a Ferric(III)-Ferrate(VI) treatment system for decentralized non-sewered sanitation systems	14
What I Learned in Borneo: Passing Orangutans to the Future	15
Studies on the immune response of host cells to intracellular parasitism by <i>Mycobacterium</i> species	16
Sustainable Development through Animal-Assisted Interventions: A Human–Animal Partnership for Well-being	17
Thinking About SDGs from Animals' Perspective: Life, Environment, and the Future	18
INDEX	19

Primary goal: SDG 4 Quality Education and SDG 1 No Poverty

Research

Needs Assessment in a Rural Community of Bandung, Regency, West Java, Indonesia

Alexandria Scarlett, MPH¹

¹ University of Miami, Miami, FL, United States

Abstract

Background: Indonesia is well known for its culture however, the quality of life of its citizens has been an area that lacks research due to the shortage in the profession.

Objective: This project, conducted in Bandung, Indonesia, in collaboration with Padjadjaran University, aimed to train students in research methods while assessing the quality of life in rural communities in Bandung Regency, West Java, Indonesia.

Methods: Data, including demographics, quality of life based on the WHOQOL-BRIEF, and needs and urgency related to the UN Sustainable Development Goals were collected through surveys administered via a free survey tool, called KoboToolbox, with assistance from village leaders and local clinic stakeholders over the course of three weeks in July 2024.

Results: Education was identified as both a critical need and an urgent priority in these communities based on our needs assessment. This need was a reflection of the demographics of the survey participants in the communities. A significant proportion of the participants had limited education, with 34.7% reporting only primary school as their highest level of individual education (n = 118).

Conclusion: This project underscored the importance of community involvement and demonstrated the need for targeted interventions to improve education and overall quality of life in rural areas.

Keywords: SDGs, Bandung, Rural, Education

Primary goal: SDG 3 Good Health and Well-being

Research

Mini-Systematic Review of Managing Malaria in Children Under Five in the Kpone-Katamanso Municipal District of Ghana, Africa through Long-Lasting Insecticide-Treated Bed Nets

Akerberg, Allyson

¹Liberty University, Lynchburg, Virginia

Abstract

Objective: This mini-systematic review will examine if long-lasting insecticide-treated bed nets (LLITN) is an effective method for preventing and managing malaria in the Kpone-Katamanso Municipal District of Ghana, Africa for children under the age of five years old.

Evidence Review: After a full-text reading of the thirteen appropriate articles, eight were selected for review inclusion for this mini-systematic review from of three electronic databases, Google Scholar, The Journal for Infectious Diseases, and Liberty University Jerry Falwell Library (EBSCO).

Findings: The key findings were high prevalence and utilization of bed nets, poor installation and understanding of bed nets, and a developing insect resistance to specific insecticide-treated bed nets.

Conclusion: Long-lasting insecticide-treated bed nets can effectively prevent and manage malaria in children under five years old. However, improvements in community education and the net's components are needed for their full effectiveness. Pyriproxyfen, chlorfenapyr, and piperonyl butoxide long-lasting insecticidal nets are more effective than pyrethroid-only nets, and individuals need to be educated on their use, installation, and maintenance to protect their families.

Relevance: In 2023, malaria caused 263 million cases and 597,000 deaths globally. The WHO African Region had 94% of cases and 95% of deaths, with children under five accounting for 76% of all deaths. The region's health is a significant global health concern.²

Keywords: Insecticide Treated Bed Net; Malaria; Prevention; Under Five Children; Sub-Saharan Africa; Effectiveness

Relevant goals: SDG 6 Clean Water and Sanitation

Primary goal: SDG 3 Good Health and Well-Being

Research

Surveying Congenital Heart Disease: Be Sure to Call Your Mother

Anahied Rayzian¹

¹ Northern Illinois University, Dekalb, IL, United States

Abstract

While survival has improved and continues to rally, especially for complex cases of CHDs, the long-term mortality rate for patients who have had congenital heart surgery still lags behind the general population, with research potential demonstrated within maternal gestation factors through epidemiological surveillance.

The precise distribution of congenital heart defects (CHDs) in the United States is unknown. Estimates through the CDC indicate the variable affectation totals nearly 1% of births, or 40,000 infants per year. CHDs are the most expressed birth defect in the United States.² Advancements in clinical care and surgical management have drastically improved the survivability of infants born with CHDs.^{2,4} The overall Standardized Mortality Ratio (SMR) stands at 8.3, marking these patients as 8.3 times more likely to die than the general population.^{4,5,6} Through incomplete clinical sampling, lack of identifiable genetic information, and underfunded research, many CHD cases remain etiologically unknown.⁷ It is currently understood that 15% of cases of CHD have a causal relationship with genetic factors, the relationship between environmental pollution and the role of CHDs could be realized for up to 30% of cases studied.¹

Public health initiatives capturing patient information have been historically disconnected, with varying state by state infrastructure and reporting standards that are not inclusive of comprehensive risks, by virtue of limited data through inadequate surveillance methodology.³

This elevated risk persists even for historically "milder" defects, such as patent ductus arteriosus and atrial septal defects.⁴ While some cases can be tied to chromosomal or genetic abnormalities, researchers have openly implicated the embryological capacity for mutation through teratogenic exposure during cardiogenesis.⁵ The significant demonstration of mortality differentiation alone warrants building a united surveillance program, capable of capturing hypothetical latent geographical patterning, and identifying under-pronounced risks. There remains untapped potential for further investigation in surveying maternal activity just prior to, and during embryological development through the course of an affected pregnancy- we need to call upon a reserve that has been underutilized in this capacity: the mother.^{4,5,7,8}

Keywords: congenital heart disease, defect, fontan

Relevant goals: SDGs

Primary goal: SDG 4 Quality Education

Research

Inaugural Interdisciplinary Public Health Class at Indonesian Medical School: Student Reflection Survey

Baylee Brochu¹

Alexandria Scarlett¹

Dwi Agustian²

Anindrya Nastiti³

Herto Dwi Ariesyady³

Tomoyuki Shibata⁴

¹ University of Miami Miller School for Medicine

² Universitas Padjadjaran

³ Institut Teknologi Dandung

⁴ Northern Illinois University

Abstract

Purpose: Indonesian Medical students have limited formal public health training outside clinical settings during their 5-year undergraduate programs. The purpose of this study was to assess the impact on students of exposure to interdisciplinary public health knowledge and field experience.

Methods: A three-week intensive summer program was offered at Universitas Padjadjaran, Bandung, Indonesia in 2024. The program was structured around a series of lectures on different aspects of Indonesian public health aligned to the Sustainable Development Goals (SDGs) followed by field experience included conducting a community needs assessment in a rural setting. Enrolled students (n = 23 with 39% medical students) completed the survey both before and after the program to assess the impact of the core lessons.

Results: Medical students' understanding of the career relevance of SDGs improved after the class. For Quality Education (SDG 4), awareness went from 11% to 44%. For Reduced Inequalities (SDG 10), it went from 0% to 11%. Their recognition of Good Health and Wellbeing (SDG 3) remained consistent. Increased awareness of reducing inequity was also observed among non-medical students. 95.7% of students said this course significantly improved their understanding of how their careers contribute to the SDGs.

Conclusion: These results highlight the impact a program like this can have on future physicians by providing opportunities to learn more about their own country and people while connecting with other young professionals both inside and outside their careers.

Relevant goals: SDGs

Primary goal: SDG 7 Affordable and Clean Energy

Practice

The Charcoal Kiln Revived by Students and Seniors in Aone, Japan

Fumiyo MURAYAMA¹

¹Azabu University, Sagami-hara, Kanagawa, Japan

Narrative

Sagami-hara City in Kanagawa Prefecture where Azabu University is located is a large city with a population of 716,494. On the other hand, Sagami-hara City has a severe imbalance in population distribution. The Aone district, while covering 11% of Sagami-hara City's total area, is a depopulated agricultural and mountain village settlement with a population of 465, where those aged 65 and over account for 64.9%.

Students from Azabu University have been participating in biodiversity surveys and community development while farming rice paddies in Aone since 2011.

The water in the rice paddies is managed by Mr. Tomichi Sato, born in 1934. He produced charcoal in a kiln he designed and built himself until 2019. According to 1953 records, charcoal production was the most profitable industry in Aone at the time.

Charcoal made from raw wood that fixes carbon dioxide in the air is a carbon-neutral energy. Broadleaf forests, where timber trees for charcoal are harvested every 10 to 15 years and regenerate through coppicing, form diverse mosaic ecosystems rich in biodiversity and contribute to regional carbon cycling.

However, as petroleum-based energy became the mainstream, charcoal sales declined. With it no longer viable as a livelihood, both money and people flowed out, accelerating depopulation.

In 2025, under Mr. Sato's guidance, students revived the charcoal kiln and produced charcoal. While learning Mr. Sato's techniques, they are exploring ways to sustain charcoal production. Even if this small kiln cannot solve all the interconnected challenges such as energy, biodiversity, depopulation, and the local economy, this learning and practice will be a small step toward regional sustainability.

Keywords: Carbon-neutral energy, biodiversity, education for sustainability, partnership, Japan

Relevant goals: SDG 4 Quality Education, SDG 7 Affordable and Clean Energy, SDG 13 Climate Action, SDG 15 Life on Land and SDG 17 Partnerships for the Goals

Primary goal: SDG 16 Peace, Justice and Strong Institutions

Practice

Spiritual Wisdom and Global Action: A Dialogue on Buddhist Teachings and the SDGs

Jun Sugimoto¹

¹Enman-ji (temple), Osaka, Japan

Narrative:

This talk, presented as a Q&A with a monk from Shinshu Otani-ha—a Jodo Shinshu denomination of Buddhism—explores how the tradition's teachings provide a spiritual and practical foundation for achieving the Sustainable Development Goals (SDGs).

The discussion focuses on three core areas. First, we examine the powerful resonance between the Buddhist concept of "equality"—Amida Buddha's salvation extending to all—and the SDG mandate to "Leave No One Behind" (Goals 1, 10). This teaching offers a profound ethical basis for addressing global inequality and discrimination. Second, the talk addresses

World Peace (SDG 16) by turning inward. Since Buddhism traces conflict and environmental damage to internal blind passions (greed, anger, ignorance), we explore how Jodo Shinshu's unique practices, like the Nembutsu, foster the introspection and self-awareness necessary to overcome these passions and promote lasting peace.

Finally, we discuss the temple's evolving role as a "place of refuge for life." We ask how regional temples and monks can practically contribute to the SDGs by offering support and a space for coexistence in the face of modern anxiety, isolation, and crises like pandemics and disasters. This dialogue is a vital opportunity to identify the actionable intersection between deep spiritual tradition and urgent global challenges.

Keywords: Jodo Shinshu, equality, peace, place of refuge for life

Relevant goals: SDG 1 No Poverty, SDG 3 Good Health and Well-being, SDG 10 Reduced Inequalities, and SDG 17 Partnerships for the Goals

Primary goal: SDG 15 Life on Land

Research

Living Together with Nature: Managing Invasive Peafowl for Biodiversity Conservation on Ishigaki Island

Kaori Higashi¹

¹Wild animal Lab, Sagamihara, Kanagawa Prefecture, Japan

Abstract

Background: The Indian Peafowl (*Pavo cristatus*) is a species of bird belonging to the order Galliformes and the family Phasianidae, and it is currently designated as a priority control species in Okinawa Prefecture. The establishment of Indian Peafowl populations poses a potential threat to native and endangered species by disrupting local ecosystems. Biodiversity conservation and invasive species control are included in Goal 15 of the Sustainable Development Goals (SDGs): “Life on Land.”

Goal: The goal of this research was to make clear the situation of peafowl on Ishigaki Island. Specifically, I aimed to investigate the areas on Ishigaki Island in which peafowl are active, the time of day they are active and the effect of climate and temperature on peafowl behavior.

Methods:

Capture of Peafowls: Captures were carried out at three locations: two individuals (Individuals 1 and 2) were caught at the first site, and one individual each (Individuals 3 and 4) were captured at the second and third sites.

Logger Settings: In this study, we attached GPS data loggers to Indian Peafowls to investigate their distribution, home range, and diurnal activity patterns.

Visual/Survey: The surveys were conducted from September 4 to 6, 2023, and from September 24 to 27, 2024.

Results:

Based on visual surveys, Indian Peafowls were found to be distributed throughout most areas of Ishigaki Island; however, they were not observed in the northern region or in residential areas.

Overall, the activity level of the Indian Peafowl gradually increased around 6:00 a.m. and decreased between 6:00 p.m. and 7:00 p.m., showing a clear diurnal activity pattern.

A significant positive correlation was found between activity level and temperature (GLMM, $p < 0.05$).

Conclusion: Analysis of the home range using GIS revealed that the Indian Peafowls inhabit very limited areas. At present, dissections of 36 Indian Peafowls captured in July 2025 are being conducted, and analyses of stomach contents are currently underway.

Keywords: up to five words: Peafowl, Peacock, Ishigaki island, wildlife, invasive species

Primary goal: SDG 6: Clean Water and Sanitation

Research

Hurricane Resilience of Small Community Water Systems in Puerto Rico

Lisitai Yang¹

Enrique Rodriguez Quinones²

Helen Siobhan Holguin Aguirre²

Evan B. Yao³

Quifeng Lin¹

Zepei Tang¹

Walter F Silva Araya²

Yang Deng¹

¹Department of Earth and Environmental Studies, Montclair State University, Montclair, NJ 07043, United States

²Department of Civil Engineering and Surveying, University of Puerto Rico – Mayagüez, Mayagüez, Puerto Rico, 00681, United States

³Newark Academy, Livingston, NJ 07039, United States

Abstract

Resilient water supply systems play a pivotal role in achieving water security in a changing climate. However, identifying the challenges for sustaining water supply under climate impacts and extreme weather events, as a first step toward adaptive water management, remains complex. This study assessed the adaptive behaviors of small community water systems (CWS) in Puerto Rico, focusing on their responses to Hurricanes Maria (2017) and Fiona (2022), and identified key factors contributing to their vulnerability. A mixed-methods, field-based research approach was employed, incorporating field observations, online and in-person surveys, interviews, and workshop-facilitated discussions. Data was collected from twenty-eight CWS across Puerto Rico, revealing insights into the resilience behaviors of these systems following the hurricanes. The findings highlighted system vulnerabilities, identified primary causes of water outages, and explored potential solutions for enhancing hurricane resilience. The knowledge generated from this study informs the development of principles for hurricane-adaptive water supply infrastructure in Puerto Rico. Furthermore, as small islands can serve as microcosms for studying and designing adaptation strategies applicable to mainland regions with similar conditions, the approaches and insights from this research can be effectively transferred to improve disaster resilience in water infrastructure in continental regions.

Keywords: adaptive water supply, hurricane resilience, small community water systems

Relevant goals: SDG 11 Sustainable Cities and Communities

Primary goal: SDG 8 Decent Work and Economic Growth

Practice

Working Environment in Japan: Karoshi

¹Mikiko Sakurai

¹Certified Social Insurance Labor Consultant Office, Machida City, Tokyo, Japan

Narrative

Karoshi is a Japanese socio-medical term meaning "death from overwork" (or death due to excessive workload). The result of an extreme workload and stress leads to sudden death (stroke, myocardial infarction) or suicide due to mental illness caused by overwork. It is not merely about being "tired from work"; it is a severe social issue where labor is the direct cause of the loss of life.

The promotion of the Work Style Reform laws mandates that companies actively prevent Karoshi. Allowing employees to work 80 to 100 hours of overtime per month (known as the "Karoshi Line") or failing to implement anti-power harassment measures can cause Karoshi, resulting in severe damage to the company, including criminal penalties, high-value civil lawsuits, workers' compensation liability, and public disclosure of the company's name. As a Certified Social Insurance Labor Consultant, we propose three specific actions and one ultimate vision to make "Karoshi" a thing of the past and realize the desired future of work.

Three Actions to Implement

1. Thorough Compliance: Strictly enforce policies to comply with statutory maximum working hours. This is the foundation of everything.
2. Shifting Mindset from "Time" to "Results": Refresh the old values that glorified long working hours and transition to a culture that emphasizes productivity and output.
3. Active Health Management: Implement legally mandated stress checks and health interviews by industrial physicians in an effective manner, not merely procedurally.

Our Vision

Through these actions, our vision is a society where "decent work" (Hataraki-gai) and "economic growth" are both achieved.

We believe that creating a way of working where every employee is healthy, feels rewarded, and can enrich their own lives will ultimately lead to sustainable growth in the Japanese economy.

Ultimately, a commitment to legal compliance and employee welfare is not just about avoiding legal risks. We are confident that this is the key to building a sustainable, productive Japanese workforce and promoting economic growth.

Keywords: Karoshi, Working Environment, Risk Management

Relevant goals: SDG 3 Good Health and Well-being

Primary goal: SDG 4 Quality Education

Passion Statement

Veterinary Roles in Achieving Sustainable Livestock

Nami Chapman¹

¹Azabu University, Sagamihara, Kanagawa, Japan

Abstract

It is well known that livestock production contributes to global warming. However, animal farming is an industry that has supported humanity culturally, nutritionally, and socially for thousands of years. I believe that losing animal farming would be a significant loss for humanity. Rather than simplistically labeling livestock production as “evil” because it causes environmental impact, transforming it into an industry that contributes to building a sustainable society is my passion and my dream for the future.

My current field of study is veterinary medicine, and within that, I am particularly interested in research on bovine mastitis. Mastitis is a disease caused by pathogenic microorganisms, such as bacteria, invading the mammary gland, where they colonize and multiply. It is one of the most prevalent diseases among dairy cows in Japan, causing reduced milk production leading to significant economic losses. Milk that could otherwise be used to feed people has to be destroyed because it is not safe for consumption. Reducing such diseases leads to stable milk production, which I believe ultimately contributes to achieving the SDG goal of “Zero Hunger.”

Currently, Japan's livestock industry faces various challenges, including soaring feed prices and outbreaks of infectious diseases. Within this context, leveraging veterinary knowledge to enhance productivity is an essential effort for achieving a stable supply of high-quality food.

“Zero Hunger” is one of the major challenges I believe an industrial animal veterinarian which I would like to work as can contribute to within the SDGs.

Keywords: Veterinary medicine, Dairy Cow, Bovine Mastitis, Infection

Relevant goals: SDG 11 Sustainable Cities and Communities

Primary goal: SDG 4 Quality Education

Education

Lighting the Way: Roshan Learning Center's Mission to Sustain Refugee Education in Indonesia

Nur Izzati G. Avmeilputri^{1*}, Ghina Rifkiya²

¹Roshan Learning Center, Jakarta, Indonesia

²Universitas Pendidikan Indonesia, Bandung, Indonesia

Narrative

Education is recognized as a fundamental human right under the 1948 Universal Declaration of Human Rights. As of August 2025, Indonesia hosts 11,909 refugees and asylum seekers, with approximately 30% being children. While Indonesia has not ratified the 1951 Convention Relating to the Status of Refugees, it is a signatory to the 1989 Convention on the Rights of the Child (UNCRC), which affirms every child's right to education. Global frameworks such as Sustainable Development Goal 4 and UNHCR's Refugee Education 2030 strategy further advocate for inclusive, equitable, and lifelong learning opportunities for all children, including those displaced.

In Indonesia, access to formal education for refugee children may be shaped by various administrative and systemic factors. Within this context, community-based learning centers play a vital role in supporting educational continuity. Roshan Learning Center—whose name means “light” in Persian—serves as a key example of such an initiative. Through programs like Elite Open School (EOS) and GED Preparation, Roshan provides refugee learners with adaptable pathways to sustain their education during displacement and prepare for future academic or vocational opportunities. We would like to take this opportunity to share Roshan's contributions to refugee education in Indonesia, and how Roshan's model offers a viable solution into community-driven approaches that uphold sustainable education spirit among displaced people.

Keywords: Education, Refugee, Sustainable Education, Refugee Education.

Relevant goals: SDGs 4 – Providing sustainable education for refugee in Indonesia

Primary goal: SDG 6 Clean Water and Sanitation

Research

Development of a Ferric(III)-Ferrate(VI) treatment system for decentralized non-sewered sanitation systems

Ruimeng Liu¹

Zepei Tang¹

Yang Deng¹

¹ Department of Earth and Environmental Studies, Montclair State University, Montclair, New Jersey 07043, United States

Abstract

To address the challenge of decentralized wastewater management in non-sewered areas, this study developed and evaluated a two-stage ferric(III)-ferrate(VI) chemical treatment system. Primary influent wastewater from a municipal plant was treated sequentially with ferric chloride (FeCl₃) for coagulation and potassium ferrate (K₂FeO₄) for oxidation and disinfection. Optimal doses were determined at 50 mg Fe/L for both stages. The combined process achieved over 99% total suspended solids (TSS) removal, reduced total chemical oxygen demand (COD) by 94.5%, and completely removed phosphorus. Pathogen indicators were significantly

inactivated, reaching up to 5.5 log reductions for *E. coli* and total coliforms. pH self-compensation between ferric acidification and ferrate alkalization maintained effluent pH near

neutrality (6.4–7.1), minimizing the need for pH control. Nitrogen species were largely retained, with minor transformation of organic to inorganic forms. The resulting effluent quality met or surpassed several U.S. reuse and discharge criteria like non-edible crop irrigation, demonstrating the system's potential for compact, energy-efficient, and low-maintenance deployment in decentralized or emergency applications. This ferric–ferrate treatment concept provides a practical and sustainable pathway for next-generation sanitation systems supporting water reuse in resource-limited settings.

Keywords: Ferric, ferrate, decentralized water treatment, non-sewered sanitation systems, chemical enhanced primary treatment

Relevant goals: This study aimed to develop and optimize a compact ferric–ferrate chemical treatment system for decentralized wastewater management. The goals were to achieve efficient removal of solids, organics, nutrients, and pathogens under minimal operational requirements, and to evaluate its potential for safe water reuse and non-sewered sanitation applications.

Primary goal: SDG 15 Life on Land

Practice

What I Learned in Borneo: Passing Orangutans to the Future

Sasaki Ann¹

¹Azabu University, Sagamihara, Kanagawa, Japan

Passion Statement

This summer, I traveled to Borneo, Indonesia, to observe my favorite animal, the orangutan — a great ape now critically endangered due to rapid deforestation for palm oil plantations. Witnessing the vast palm tree plantation fields and the few remaining forests was a profound shock. Yet, seeing a wild orangutan for the first time moved me to tears and made me realize how deeply I want to ensure their existence for future generations. Orangutans could vanish within the next decade if no action is taken. As consumers benefiting from palm oil, we in Japan share responsibility for this crisis. However, public awareness remains limited. Through this experience, I realized the urgent need to communicate the reality of unsustainable production and promote the use of certified sustainable palm oil. During my stay, I also joined local NGOs engaged in reforestation and met former illegal loggers who had changed their lives to protect the forest. Their transformation taught me that awareness can lead to change. I was also deeply struck by how peaceful and happy the local people seemed, despite limited infrastructure or wealth. Living closely with nature, they embodied a sense of harmony that modern society has almost lost. This experience taught me the true value of coexistence with nature. As Dr. Jane Goodall said, living on this planet means having an impact, and we can choose what kind of impact to make. I believe that understanding nature and sharing its importance are the first steps toward protecting it for future generations.

Relevant goals: SDG 12 Responsible Consumption and Production

Primary goal: SDG 3 Good health and Wellbeing

Research

Studies on the immune response of host cells to intracellular parasitism by *Mycobacterium* species

Sayu Yatagai¹

Naoyuki Aihara¹

¹Azabu University, Sagamihara, Kanagawa, Japan

Abstract

Background: Research has been conducted on cancer immunotherapy using bacteria. There is BCG

therapy, in which BCG, an attenuated strain of *Mycobacterium bovis* used as a vaccine in human, is administered to patients with bladder cancer. There are various theories regarding its mechanism

of action, and due to the complexity of the tumor microenvironment, it remains unclear. I hypothesized that the basis of this mechanism lies in the internalization of BCG bacteria by host macrophages, and I am conducting experiments to investigate this.

Methods: From the perspective of pathogenicity, I first investigate how bacteria of the genus *Mycobacterium* behave within cells from pathological and immunohistochemical viewpoint. Furthermore, from a therapeutic perspective, I examine pathological and immunohistochemical changes in cultured cells following BCG administration, using normal canine bladder cells and canine transitional cell carcinoma cells.

Results: Currently, I am performing immunohistochemistry on canine transitional cell carcinoma tissue sections using antibodies against IL-6, TNF- α , IFN- γ , CXCL9, SPP1. The results are still being summarized, but the staining outcomes vary among cases, with some showing positivity and others negativity.

Conclusion: In human, although the mechanism of action remains unclear, it is believed that BCG exerts therapeutic effects by inducing certain changes in the tumor microenvironment. From

a veterinary perspective, transitional cell carcinoma is a common tumor in dogs, and its malignancy varies depending on histological features. Similar to humans, it is one of the tumors that is difficult to control. In this study, If the effects of BCG can also be demonstrated in dogs and

contribute to elucidating its mechanism of action, I believe it will not only advance veterinary medicine but also help improve human mental well-being by saving diseased animals.

Keywords: Immunotherapy, Tumor, BCG, *Mycobacterium bovis*, Macrophages

Relevant goals: Industry, Innovation, and Infrastructure

Primary goal: SDG 3 Good Health and Well-being

Practice

Sustainable Development through Animal-Assisted Interventions: A Human–Animal Partnership for Well-being

Takuya Gochi¹

¹Azabu University, Sagami-hara, Kanagawa, Japan

Abstract

Animal-Assisted Interventions (AAI) contribute to multiple Sustainable Development Goals (SDGs) by promoting physical and mental well-being, inclusive education, and responsible care for animals. This presentation explores how AAI—comprising Animal-Assisted Activities (AAA), Therapy (AAT), and Education (AAE)—supports SDG 3 (Health and Well-being), SDG 4 (Quality Education), SDG 10 (Reduced Inequalities), and SDG 15 (Life on Land). Drawing from case studies in Japan and abroad, the talk highlights AAI’s social impact and its potential to foster inclusive communities through partnerships among universities, healthcare institutions, and volunteer organizations. In Japan, the expansion of AAI faces challenges such as the lack of national certification, scientific validation, and welfare guidelines. The presentation emphasizes the need for a “One Welfare” perspective—recognizing that human and animal well-being are interconnected—and discusses future directions for sustainable, ethical, and evidence-based AAI practices that align with global SDG initiatives.

Keywords: Animal-Assisted Interventions, One Welfare, Inclusion, Education

Relevant goals: SDG 4 Quality Education, SDG 10 Reduced Inequalities, and SDG 15 Life on Land

Primary goal: SDG 3 Good Health and Well-being

Research

Thinking About SDGs from Animals' Perspective: Life, Environment, and the Future

Takuya Gochi¹

¹Azabu University, Sagamihara, Kanagawa, Japan

Abstract

The Sustainable Development Goals (SDGs) aim to achieve a fair, healthy, and sustainable world by 2030. However, their realization requires considering not only human societies but also animals and ecosystems as integral parts of sustainability. This presentation examines the SDGs through an animal-centered perspective, highlighting how human–animal relationships embody the interconnection between environmental, social, and ethical dimensions of sustainability. Four SDGs are central to this discussion: Goal 3 (Good Health and Well-Being), Goal 12 (Responsible Consumption and Production), Goal 13 (Climate Action), and Goal 15 (Life on Land). First, the environmental impact of pet ownership and livestock production illustrates the need for ethical responsibility in resource use. Second, as populations age, animals contribute to social welfare through companionship and therapy. Third, veterinarians and farmers advance sustainability by promoting animal welfare, public health, and circular agricultural systems. Finally, the rise of AI and robotics in veterinary and agricultural fields calls for reflection on empathy and coexistence in future societies. By integrating these perspectives, this talk redefines animals not as passive recipients of human care but as active partners in achieving the SDGs. It emphasizes that small realizations and individual actions—when shared across communities—can lead to meaningful progress toward a sustainable and compassionate future for both humans and animals.

Keywords: Animal Welfare, Sustainability, Coexistence, Environment, Innovation

Relevant goals: SDG 12 Responsible Consumption and Production ,and SDG 15 Life on Land

INDEX

Sustainable Development Goals

SDG 2, *p12*
SDG 3, *p4,5,16, 17,18*
SDG 4, *p3,6,13*
SDG 6, *p10,14*
SDG 7, *p7*
SDG 8, *p11*
SDG 11, *pX*
SDG 15, *p9,15*
SDG 16, *p8*

Topics

Adaptive Water Supply, *p10*
Animal Welfare, *p17,18*
Animal-Assisted Interventions, *p17*
Bandung, *p3*
Boreno, *p15*
Bovine Mastitis, *p12*
Buddhist, *p13*
Charcoal, *p7*
Coexistence, *p18*
Congenital Heart Disease, *p5*
Dairy Cow, *p12*
Decentralized Water Treatment, *p14*
Education, *p3,7,13,17*
Hurricane Resilience, *p10*
Immunotherapy, *p16*
Indonesian Medical, *p6*
Insecticide Treated Bed Net, *p4*
Invasive Species, *p9*
Ishigaki Island, *p9*
Japan, *p7*
Karoshi, *p11*
Macrophages, *p16*
Malaria, *p4*
Needs Assessment, *p6*
Orangutans, *p15*
Peacock, *p9*
Peafowl, *p9*
Refugee, *p13*
Sub-Saharan Africa, *p4*
Under Five Children, *p4*
Veterinary Medicine, *p9,12,17,18*
Working Environment, *p10*