2nd International Conference on Dog Population Management



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The 2nd International Conference on Dog Population Management is endorsed by:



Delegation of the European Union to Turkey



World Veterinary Association



World Organisation for Animal Health



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A Warm Welcome from the ICAM Coalition

It is a pleasure to welcome you warmly to the 2nd International Dog Population Management Conference. We are excited for the guality and breadth of presentations on the agenda and look forward to several days of exciting new ideas, vigorous debate and the forging of new connections and collaborations. We are also heartened to see increasing participation from small and large animal welfare groups, governments and intergovernmental organisations representing work on six continents.

As members of the ICAM Coalition, our hopes are that by working together and challenging one another through scientific debate, we can raise the guality and effectiveness of our combined efforts to improve dog welfare and community wellbeing. We estimate that local, national and international groups spend well over \$20 million each year on projects to address dog management concerns, yet in 2015 we continue to face rabies outbreaks, calls for mass culling and growing concerns about dog welfare and human safety. Our path to improved dog welfare and human wellbeing is too often diverted by competition and destructive discourse.

We know that collaboration and the One Health approach, which embraces the inputs and perspectives of a wide range of stakeholders, is the key to our progress. We know that the input of communities, governments and public health officials is critical in developing the programmes that will ultimately prove successful in eliminating the health and safety concerns that drive calls for culling and other inhumane practices. Standing together, with the irrefutable proof that we are making a difference, we can bring an end to rabies, an end to inhumane culling, and an end to the issues that divide us rather than unite us in this important global work.

Sharing our successes and our learning, and valuing the input of those with whom at first we disagree, brought the ICAM coalition together in 2007. With this conference, we invite you to walk with us; let us become a stronger force together, better able to meet the needs of human and animal welfare in communities around the world.

Finally, I would like to take a moment to honour a special colleague, Ray Butcher, whom we recently lost. Ray was a founding member of ICAM and a long-time friend to many in the field. He was a patient and generous teacher who had a rare mix of expertise in veterinary science, a deep passion for animal welfare and the practical realism that comes from many years working internationally. He was wise and funny and made many friends in organizations around the world - some of whom join us here in Istanbul.

We shall miss Ray, but will strive to embody his spirit of wisdom, welfare and friendship as we embark on a learning journey here together.

Kate Atema

Chair, on behalf of the International Companion Animal Management Coalition (ICAM)

About the International Companion Animal Management Coalition

The ICAM Coalition's mission statement is to support the development and use of humane and effective companion animal population management worldwide. The goals of the Coalition are to share ideas and data; to discuss issues relevant to population management and welfare; to agree definitions and hence improve understanding and to provide guidance as a collegial and cohesive group.

The First International Conference on Dog Population Management was held in York, UK in 2012. Website: https://secure.fera.defra.gov.uk/dogs2012/index.cfm

ICAM Board members:



International Fund for Animal Welfare Kate Atema (Chair) Rebecca Brimley Eleanor Milano



Humane Society International Andrew Rowan Kelly O'Meara Joy Lee



World Animal Protection Beryl Mutonono-Watkiss Pankaj KC Ellie Parravani



Global Alliance For Rabies Control Deepashree Balaram



ICAM Coalition Dr Elly Hiby



RSPCA International Alexandra Hammond-Seaman



World Small Animal Veterinary Association Tess Kommedal

Suzanne Rogers (Learning About Animals) is the key coordinator for the conference working on behalf of ICAM.

Welcome from the Veterinary Public Health Association of Turkey

We are well aware that uncontrolled stray dog problem has adverse effects on environment as well as animal welfare and public health. In order for stray dogs to survive in urban areas stray dogs have to overcome difficulties and struggle to find food. Many die due to hunger, accidents and zoonotic disease.

It is apparent that we, the public contribute to the problem and must take responsibility. In order to improve conditions all stake holders and parties including veterinarians, medics, social scientists and individuals must take responsibility.

In order to overcome the problems dog population needs to be controlled in a humane and efficient manner.

Veterinary Public Health Association of Turkey (VHSD) very much hope that the forthcoming presentations and discussions during the 2nd International Conference on Dog Population Management will make a significant contribution.

We would like to welcome you all to Turkey and hope for a successful meeting.

Veterinary Public Health Association of Turkey.

VETERINARY PUBLIC HEALTH ASSOCIATION

Conference information

Registration and information

The registration and information desk is located in the fover and will be open late afternoon on the 2nd March and from 8am on the 3rd March. All presentations will be taking place in Ballroom 1.

Social programme

On 3rd March after the main talks programme there will be some 20-20 presentations! These are lively, fast paced presentations where speakers must present 20 images for just 20 seconds each. Check the programme leaflet for more details. This will be followed by a welcome reception.

On 4th March there will be a conference dinner away from the hotel. Tickets can be purchased from the registration desk.

Tweet!

Join the conversation! Follow the ICAM coalition on Twitter @ICAMcoalition. We will be tweeting throughout the event with the hashtag #dogpop2015.

Important numbers

Emergency phone numbers Police: 155 Ambulance: 112 Fire: 110

Conference organiser: Suzanne Rogers +44(0)7961 996628 Hotel reception desk: +90 (212) 314 42 42

Scientific Committee

All submitted abstracts were reviewed by members of a scientific committee.



Bernadette Abela-Ridder

Dr Bernadette Abela-Ridder works in the Department for the Control of Neglected Tropical Diseases of the World Health Organization as the team leader on neglected zoonotic diseases. Previously, Bernadette worked in the Department of Food Safety and Zoonoses of WHO leading an integrated capacity building network, the Global Foodborne Infections Network (GFN) and was the WHO focal point for GLEWS, a joint WHO, Food and Agriculture Organization of the U.N. (FAO) and World Organisation for Animal Heath (OIE), Global Early Warning System for transboundary animal diseases, including zoonoses. She also managed the study to estimate the global burden of leptospirosis in humans. She is closely involved in advancing common areas of work of the FAO, OIE and WHO with regard to zoonotic, food safety and other risks emerging at the human-animalecosystem interface. Bernadette previously worked for the US Food and Drug Administration on emerging antimicrobial resistance at the interface of animals, humans and food; for the Institut de recherche pour le développement (IRD) in Cameroon on the emergence of simian immunodeficiency viruses from non-human primates including bushmeat; for the FAO on transboundary animal disease control programmes and in clinical veterinary practice.



Sarah Cleaveland

Prof. Sarah Cleaveland works at the University of Glasgow at the Institute for Biodiversity, Animal Health and Comparative Medicine. After training first as a zoologist at Southampton University and then as a vet at Cambridge University, she worked for a year in general practice before embarking on a research career based in East Africa, studying diseases at the human-animal interface. She obtained her Ph.D. from the London School of Hygiene and Tropical Medicine, working on the epidemiology of rabies in the Serengeti, and subsequently joined the Centre for Tropical Veterinary Medicine, University of Edinburgh before moving on to the University of Glasgow in 2008. Sarah's research addresses many different aspects of human and animal disease investigation, but the control and elimination of rabies in domestic dogs remains a principal focus of her work. She continues to work in East Africa, but her research programme also involves links with rabies projects in several other countries of Africa and Asia. She was a founding director of the Alliance for Rabies Control, a Scottishregistered charity, which spearheads the World Rabies Day campaigns (www.worldrabiesday.org). In 2014 she was awarded an OBE for services to veterinary epidemiology, primarily for her work on rabies.



Katie Hampson

Katie is interested in the ecology of infectious diseases, particularly rabies, with the aim understanding infection dynamics across spatial scales and the impacts of control efforts. She uses a combination of detailed field investigations, vaccination interventions and modelling. Katie's main areas of research include transmission dynamics, impacts of population structure, demography, and geography on spatiotemporal dynamics, vaccination strategy and surveillance design. She is particularly interested in the dynamics of infections in partially vaccinated populations, the determinants of disease persistence and challenges to eliminating infectious diseases. Katie's research informs policies, and practice for the control of infectious diseases, through collaborations with international agencies and national governments in Africa, Asia and the Americas.



Katinka de Balogh

Dr Katinka de Balogh studied veterinary medicine in Berlin and Munich and obtained her doctorate in tropical parasitology from the Tropical Institute of the University of Munich in 1984. She further specialized in tropical animal production and health (France) and in Veterinary Public Health (VPH) (Netherlands). After a short career as a zoo veterinarian in the Rotterdam Zoo she moved to Africa where she worked for 9 years as a district veterinary officer in rural Zambia and lecturer at the veterinary faculties of Lusaka (Zambia) and Maputo (Mozambigue). In these positions she worked extensively in rabies control at national and local levels. After positions at the World Health Organization (WHO) and at the Utrecht veterinary faculty in the Netherland, she moved in 2002 to Rome (Italy) to take up a position at the Headquarters of the Food and Agriculture Organization of the United Nations (FAO). Presently she leads the global Veterinary Public Health activities of FAO.



Nancy De Briyne

Nancy De Briyne studied veterinary medicine in Ghent (Belgium), graduating in 1996. After working as a veterinary practitioner in Belgium and the UK, she works since 2000 for the Federation of Veterinarians of Europe. At FVE she is specifically responsible for dossiers in field of animal welfare, veterinary medicines, education and communication. Presently, she is Deputy Executive Director of the FVE. Since 2010, she also became Policy Officer for the World Veterinary Association. She has worked extensively in the field of increasing veterinary education in animal welfare and veterinary medicinal products, publishing in 2009 an overview of animal welfare teaching in veterinary undergraduate education in Europe and working on Day 1 Competences in the field of animal welfare for veterinarians. She also assisted the development of a European Veterinary College on Animal Welfare and Behavioural medicine. Her aspiration is to create the right conditions for veterinarians to be and continually strive to be, the leading advocates for good welfare of animals in a continually evolving society.



Elly Hiby

Dr Elly Hiby is an independent animal welfare consultant and Scientific Coordinator to the International Companion Animal Management (ICAM) Coalition. Her most recent work with the ICAM Coalition focused on affordable and meaningful impact assessment of dog population management interventions. Previously she worked at Dogs Trust as International Director, and before that, at the World Society for the Protection of Animals (WSPA) for eight years, including leading on the companion animal welfare programme and advising on humane rabies control internationally. She has also worked as a technical expert with the World Animal Health Organisation (OIE), the World Health Organisation (WHO), and the Food and Agriculture Organisation (FAO) on dog population management. It was through her work with WSPA that she first came into contact with the Alliance for Contraception of Cats and Dogs (ACC&D) and subsequently joined their board of directors. The ACC&D works as a catalyst for the successful introduction of methods to non-surgically sterilise dogs and cats.



Giovanna Massei

Giovanna is a senior ecologist based in York (UK). She received her BSc from Florence University (Italy) and her PhD from Aberdeen University (UK). Giovanna has over 25 years' experience in non-lethal approaches to mitigate human-wildlife conflicts. She has worked extensively on wildlife management, animal behaviour, population ecology and on fertility control for wildlife and dogs in the context of population management and disease control. Giovanna published more than 120 scientific and popular articles. She is Associate Editor for the journal Human-Wildlife Interactions and a Scientific Advisor for the EAZA Group on Zoo Animal Contraception. Giovanna established collaborative research with government and non-governmental agencies and academic partners in the UK and in countries that include Montserrat, India, Italy, Hong Kong, Morocco and Nepal. In 2012 Giovanna led the 1st International Conference on Dog Population Management in York, which attracted circa 170 delegates from 35 countries.



Michelle Morters

Michelle qualified as a vet from Massey University (New Zealand) in 1995. She was in clinical practice in the United Kingdom and New Zealand for about 10 years. In 2005 Michelle was employed by the International Fund for Animal Welfare (IFAW) as Program Manager for the global Companion Animals Program. In early 2007, she transitioned to part-time Veterinary Advisor for IFAW and commenced parttime doctoral studies at the University of Cambridge in veterinary public health and epidemiology, specifically evaluating rabies control in free-roaming dogs. Michelle completed her PhD in 2014, and has since continued her research into dog population dynamics and rabies control as a Research Associate at the University of Cambridge. She was a founding member of the International Companion Animal Management Coalition (ICAM).



Nilufer Aytug

Aytug was born in Bursa/TURIYE on the 21st of April in 1959. After qualifying from Istanbul University, Faculty of Veterinary Medicine, she received her PhD degree from the same University. She was a Clinical Professor at the Uludag University Faculty of Veterinary Medicine from 1998-2011. At the Uludag University, Faculty of Veterinary Medicine, she worked with cats, dogs, exotics, and wildlife including brown bears. She authored books, book chapters and chapter translations; authored or co-authored scientific publications and scientific abstracts. She has a passion for teaching and lectures extensively at local, regional and national meetings. She dreams to live, work and act in a loving, respectful way towards the earth and towards all living beings, every insect, animal, fish, bird, plant, human and tree. She continues to work at the Faculty of Veterinary Medicine/Near East University.



Leopoldo H. Stuardo Escobar

Chilean veterinarian from the Universidad de Chile, Master in Environmental Science and Management by the Université Catholique de Louvain (LLN), Belgium. Leopoldo has a broad experience working at international level dealing with sanitary trade negotiations and in developing national and international animal welfare standards. Such activities were been developed at the Agriculture and Livestock Service from the Chilean Ministry of Agriculture, at the Chilean Mission to the European Union in Brussels and at the Headquarters of the World Organisation for Animal Health (OIE) in Paris. Currently, Leopoldo is working at the International Trade Department, in charge of the animal welfare activities related to the OIE Terrestrial Animal Health Code.

Louis Nel

Louis Nel is a full Professor at the University of Pretoria where he has led numerous research programmes focused on improved understanding and control of lyssaviruses and rabies. His research relies on state of the art methods in molecular biology and specific research topics include diagnostic development, vaccinology, immune contraception, viral pathogenesis, host/virus ecology, molecular epidemiology and virus evolution. Prof Nel is a permanent member of the World Health Organization (WHO) expert advisory panel on rabies and served as chair for the WHO Expert Consultation on Rabies (2012) and as member of the international steering committee of the BMGates Foundation/ World Health Organization (WHO) rabies control programmes. He is also the coordinator for the Southern and Eastern African Rabies Group (SEARG) and scientific advisor as well as organiser and chair for the past five international conferences. In other international and global roles he is an active member of the technical expert panel of the IAEA/ FAO (International Atomic Energy Agency and UN Food and Agriculture Organization), and served on rabies committees of the OIE (World Organization for Animal Health). Prof Nel assisted the Global Alliance for Rabies Control (GARC) and the Partners for Rabies Prevention (PRP) in various capacities since 2008. In September 2014, he became the Executive Director of GARC.



Lisa van Dijk

Lisa van Dijk BSc MSc PgDip is an animal health and community development specialist with long-standing experience in management of food security, livestock and sustainable livelihood projects and programmes in developing countries, incorporating community participation at all stages of the project cycle. She has grass root level experience in community engagement and behaviour change, innovations, development and implementation of participatory methodology such as PRA/ PLA, Participatory Action Research and Participatory Action Tools for Animal Welfare. Lisa has worked extensively on the design and implementation of staff training programmes and on building local staff capacity, especially in the fields of project management and community development. Lisa is co-authored of Sharing the Load: a guide to improving the welfare of working animals through collective action (Practical Action Publishing, 2011 ISBN: 9781853397196)



Marco A. N. Vigilato

Veterinary Public Health Adviser, at Pan American Health Organization/World Health Organization. Of Brazilian citizenship, he received his veterinary degree from the University of Marília, Brazil in 1999. He further obtained his post-degree in "Planning Animal and Public Health", and a Masters in "Animal Heath, Food Safety and Veterinary Public Health", both from the State University of São Paulo, Brazil. In 2002 he became the "Chief of the Centre for the Control of Vector-borne and Zoonotic Diseases", Health Department in Birigui, Brazil. In 2004 he worked at the State Veterinary Office (IAGRO) in Mato Grosso do Sul, Brazil. He became a professor in the field of public health field in two Colleges from 2007-2010, and Director of the Veterinary Hospital at a private College. From 2004 to September of 2010, he served as veterinary public health specialist, at the Health Department in São Paulo City, Brazil, and occupied two management positions: Deputy Manager of Food Safety and Surveillance (2005-2007) and Manager of the Zoonosis Control Center, CCZ - (Head of WHO/ Collaborating Center in Urban Zoonosis) (2008-2009). Since September 2010, he works in veterinary public health for PAHO/WHO, to provide technical cooperation to Latin American countries to strengthen their capacities for surveillance, prevention and control of rabies and other neglected zoonotic diseases.



Marijana Vucinic

Marijana Vucinic is full Professor of Animal Behaviour, Welfare and Protection at the Faculty of Veterinary Medicine of University of Belgrade – Serbia since 1999. Previously, she spent three years as mixed practice veterinarian in a village 100 km far from Belgrade and 10 years as teaching assistant and assistant Professor of Domestic Animal Health Care, University of Belgrade, Faculty of Agriculture. Marijana Vucinic is a member of Serbian Veterinary Society and Regional Animal Welfare Centre for Balkans. She has published many papers on animal welfare, particularly on free roaming dog welfare issues. Marijana Vucinic is active lecturer, researcher and participant in numerous international meetings on animal welfare.



Boris Yakobson

Dr Yakobson got his DVM degree from Faculty of Veterinary Medicine, Academy of Agriculture, Riga, Latvia, Diploma in Clinical Veterinary Medicine, form School of Continuing Education, Tel Aviv University Israel and PhD in Infectious Diseases and Microbiology, from Faculty of Veterinary Medicine, University of Agriculture, Latvia. He started his professional activity as practitioner in Circus and later become Certified Specialist in Veterinary Anatomy and Pathology. Currently he is Head of the Rabies National Laboratory, Kimron Veterinary Institute, Bet Dagan, Israel and Team Leader in EU-funded technical assistance project "Control and/or eradication of animal diseases" in Kosovo. He have more than 25 years professional experience and undertaking research, leading to widely-recognized expertise in rabies diagnosis, epidemiology and control/eradication, preparation, planning, implementation of nation-wide and regional rabies vaccination plans in wildlife and domestic animals. He initiated, defined and managing web-based national dog ownership registry including rabies vaccination records.

List of talks

Keynote speakers	Population dynamics	
Professor James Serpell – The importance and diversity of the human-dog relationship	Van Dang – Dog population management in Vietnam	 Dunja Kovac – Decreasing the relinquishment of owned dogs by implementing behavior modification therapy
Dr Linda Rhodes – An overview of non-surgical sterilisation	Daryyn Knobel – Dynamics of an owned, free- roaming dog population: implications for population management	Daniel Stewart – Tracking dogs in a free living environment with respect to vaccination monitoring
Education and community engagement	Ganga de Silva – Sterilising more than 80% of female dog population: is it enough to keep the population under control?	Louisa Tasker – Recommendations for using behavioural indicators to assess animal welfare impact of dog population management interventions
through education	Stefano Mesouri – Are DPM programmes targeting the source of FRDs? A 13-years retrospective study	 Shanis Barnard – Towards a scientific-based assessment of dogs' welfare in shelters
Christina Siettou – Public perceptions on the dog overpopulation problem in the UK including an investigation into willingness to pay for humane management	Joy Lee – Dog Population Management in Jamshedpur, India: a model for improving welfare and achieving impact through human behavior change	Heather Bacon – Development of a robust canine welfare assessment for dogs in trap-neuter-return programmes
Melania Gamboa – Five key messages for the prevention of dog bite material	John Boone – Population size estimates for street dogs: the good, the bad and the shortcuts.	 Harry Eckman – A review of published studies on dog population management
Elena Garde – Development of integrated and humane management solutions to diminish negative effects of free-roaming dogs on a Chilean Patagonian community	 Syed Israr Shah – Abundance of pet dogs in Rawalpindi district of Pakistan 	Government collaboration ■ Rita Garcia – Characterization and reproductive control
Giovanna Massei – Assessment of free-roaming dog health and evaluation of knowledge, attitude and practice of dog owners to canine rabies in Chitwan District. Nepal	 Anna Czupryna – Free-roaming domestic dog demography in rural villages near Serengeti National Park, Tanzania Hanna Lentz – Community regulation of the ecology of 	 program of pet population in São Paulo, Brazil Raffy Deray – Human and animal health collaboration in rabies control in the Philippines
Kati Loeffler – Community trust and engagement are necessary for resilience in a rabies outbreak	 Initial control of the second state of the second sta	 Aung Swi Prue Marma – Mass dog vaccination (MDV) and One Health implementation for rabies control in Bangladesh
Kate Atema – Dogs are a development issue: The social impacts of roaming and poorly managed dogs on human communities	Asia Pacific	 Brighton Marienga – Implementing rabies control strategy in a devolved government, adoption of One Health approach
Rebecca Brimley – A people centered approach to dog population management		Nadegè Leboucq – OIE initiatives to improve stray dog population control, an example from Europe

Breakout sessions

Introduced by Harry Eckman and facilitated by Elly Hiby – Are we making a difference? This session will be a deep dive into the new guidance from ICAM on how to evaluate whether our work is making an impact.

Facilitated by the ICAM Coalition – Help us to help you. The ICAM Humane Dog Population Management Guidance has good ingredients but could do with a refresh. Tell ICAM how we can make the guidance work better for you.

Linda Rhodes

Linda attended veterinary school at University of Pennsylvania in the late 1970's and practiced bovine practice in Utah and Idaho. After several years, she returned to get a PhD degree at Cornell in reproductive physiology, and began her career in the pharmaceutical industry, where she worked for Merck and Merial. She founded AlcheraBio, a business to help companies develop new drugs for animals, where she worked with Peptech to bring Suprelorin, the male dog contraceptive implant, to the market in Europe. She has been on the Board of the Alliance for Contraception in Cats and Dogs for more than 10 years, and serves on the Scientific Advisory Board of the Found Animals Foundation. In 2011, she helped found Aratana Therapeutics, a new animal health company developing innovative drugs for dogs and cats, taking the best of human biotech and bringing it to help pets with cancer, pain, allergy and other important medical conditions. Linda lives in New Hampshire, and has one son, who is attending law school in Boston.

Kate Atema

Kate is Director of the Global Companion Animal Programme at IFAW, overseeing community-based dog and cat welfare projects in 12 countries on five continents. Kate began her career at the Social Science Research Center in Berlin, Germany, and holds a Masters Degree in Animals and Public Policy from Tufts University in the US, where she subsequently served as adjunct faculty and enjoys mentoring students in global animal welfare policy and research. Kate has published numerous articles in scientific and popular literature on topics ranging from assistance dogs to Animal Law, with recent emphasis on the impacts of animal welfare on communities. Kate and her team at IFAW are focused on the development of novel methods for empowering communities to meet long-term human and animal welfare development goals. Kate is currently Chairperson of the International Companion Animal Management Coalition (ICAM).

James Serpell

James Serpell is the Marie A. Moore Professor of Animal Ethics & Welfare at the School of Veterinary Medicine, University of Pennsylvania. He received his bachelor's degree in Zoology from University College London in 1974, and his PhD in Animal Behavior from the University of Liverpool (UK) in 1980. He directed the Companion Animal Research Group at the University of Cambridge (1985-1993) before moving to his current position at the University of Pennsylvania. His research focuses on the behaviour and welfare of dogs and cats, the development of human attitudes to animals, and the history and impact of human-animal relationships. He has written more than 120 articles and book chapters on these and related topics, and is the author, editor or co-editor of several books including The Domestic Dog: Its Evolution, Behaviour & Interactions with People (1995) and In the Company of Animals (1996).

Heather Bacon

Heather graduated from the University of Liverpool, UK with a first class Intercalated Honours degree in Veterinary Conservation Medicine and from the University of Bristol, UK with her BVSc (DVM) Veterinary degree. She has obtained her postgraduate Certificate in Zoological Medicine from the Royal College of Veterinary Surgeons. Heather has worked with a number of animal welfare NGOs in a range of different countries, mostly in the fields of dog welfare and zoo animal welfare. She is currently working as Veterinary Welfare Education and Outreach Manager in the Jeanne Marchig International Centre for Animal Welfare Education (JMICAWE) at the University of Edinburgh, responsible for developing research projects and animal welfare education programmes on dog welfare issues, particularly on the issues of dog shelters, trap-neuter-return and veterinary education in dog behaviour.

Shanis Barnard

Shanis is an ethologist and graduated at the University of Parma (Italy) in Biological Sciences. Her thesis, on the validation of a temperament test for shelter dogs, was the first step toward her current main areas of interest which include human-animal relationship, dog behaviour, cognition and welfare. Shanis awarded her PhD in Behavioural Biology in 2011 where her studies aimed at investigating temperament and cognition in different dog breeds. Shanis worked for three years as a researcher for the Human-Animal Relationship and Animal Welfare Unit at the Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise where her research focused on the use of animal-based measures for the development of practical welfare assessment protocol for dogs housed in rescue shelters. At present Shanis has been appointed for a Post Doctorate fellowship at Queen's University Belfast on canine behaviour and welfare on a BBSRC funded project. Her favourite teacher is her pet dog Mia.

Valerie Benka

Valerie Benka is Project Manager for the Alliance for Contraception in Cats & Dogs (ACC&D), a USbased non-profit organization working to expedite the successful introduction of methods to non-surgically sterilize dogs and cats, and to support the distribution and promotion of these products to humanely control animal populations worldwide. She is responsible for coordinating a variety of organization initiatives, including a project to develop a method to mark and identify free-roaming dogs who are non-surgically sterilized and/or vaccinated against rabies. Valerie iust celebrated her two-vear work "anniversary" with ACC&D. Prior to this, she attended the Animals and Public Policy Program at Tufts University's Cummings School of Veterinary Medicine, where she explored strategies to expand humane dog population control in Kathmandu, Nepal. Valerie also has graduate degrees in Conservation Biology and Public Policy from the University of Michigan, where she focused on humanwildlife conflict in rural Kenya.

John D. Boone

Dr Boone is a wildlife biologist whose work focuses on applied conservation issues. He received a B.S. in Biology and Physics from George Washington University, and a Ph. D. in Biology from the University of Colorado at Boulder. After ten years on the faculty of University of Nevada Reno, he moved to the Great Basin Bird Observatory, a Nevada non-profit organization that provides biological monitoring, research, and conservation planning services to federal and state resource management agencies across the western U.S. Dr Boone began his involvement in animal welfare in 2000 at the SPCA of Northern Nevada as a volunteer, board member, and then board chair. More recently, he has served as a scientific advisor and board member for the Alliance for Contraception in Cats & Dogs, and as a consultant to HSI, GARC, and Maui Humane Society on multiple free-roaming dog and cat projects.

Becky Brimley

Becky has worked in animal welfare and conservation for over 15 years. In recent years she has helped shape IFAW's Companion Animal Program and currently oversees IFAW's Humane Community Development initiative, using her skills as a team workshop facilitator and trainer in strategic planning and reporting to ensuring that projects have measureable, positive impacts for animals and communities. She provides technical advice on how to accomplish those goals and ways to share IFAW's Companion Animals expertise with others.

www.linkedin.com/in/BeckyBrimley

Van Dang Ky

Dr Van Dang Ky earned his Doctor of Veterinary Medicine more than 36 years ago. He took a PhD degree (Doctor of Philosophy) in Veterinary Science in 2002. After graduation, Dr Van Dang Ky has worked for the Department of Animal Health in Viet Nam since 1978. He is currently a national coordinator of the FAO funded project for the control of rabies. Dr Ky spent most of his professional time on zoonotic diseases such as rabies, avian influenza, anthrax and many other major diseases in animals in Viet Nam. Dr Ky has a large number of publications, including scientific articles, books and manuals that have been used to support disease control in Vietnam. As a chief of Epidemiology Division, Department of Animal Health in Viet Nam. He was the first to build national programs and regulations to prevent rabies in Vietnam. With great contributions to his country and ASEAN, Dr Ky has been recognized nationally and internationally for many years. He has been invited to present experiences and information about zoonosis experience in Vietnam in its many important conferences in the world.

Ganga de Silva

Ganga de Silva graduated as a veterinary surgeon from University of Peradeniya, Sri Lanka in 1997 and obtained Master of Business Administration (MBA) from University of Sri Jayewardenepura in 2004. After working in several organisations in different capacities Ganga joined Blue Paw Trust in 2006 to combine her passion for management with love for animals to improve animal welfare. She was the Project Coordinator of "Humane Dog Population and Rabies Management Project, Colombo" (2007 - 2012) and currently as the Director Operations coordinates field projects, disseminates knowledge gained during Colombo project to local and international organisations, writes project proposals, prepares budgets, negotiates with collaborators to start new projects, and works as part of the field team. Further, she works with the Sri Lankan government and other organisations to eradicate rabies from the country through a one health model which ultimately will lead to enhanced animal welfare in Sri Lanka.

Raffy A. Deray

Program Manager, National Rabies Prevention and Control Program, Department of Health, Philippines Dr Raffy A. Deray is a Doctor of Medicine with a Masters Degree on Public Health. He Is the National Program Manager of National Rabies Prevention and Control Program (NRPCP) of the Department of Health in the Philippines. He is also the national project manager/ International Coordinator of one of the WHO –BM Gates Foundation project for human and rabies elimination, a project requiring extensive collaboration with the Department of Agriculture-Bureau of Animal Industry. He was one of the crafters of the Administrative Order signed by president Aquino, creating the Philippine Inter-Agency Committee on Zoonosis (PhilCZ) a committee responsible in developing a national strategy on prevention, control and elimination of zoonoses

Harry Eckman

As an animal welfare specialist, Harry has managed companion animal population management and shelter management programmes throughout Europe. He has worked for the Mayhew Animal Home, RSPCA and Wood Green Animal Shelters.

His international work has included improving welfare standards in shelters and veterinary facilities, directing humane dog and cat population management projects and incorporating dog and cat behavioural and welfare concepts into stray population management programmes.

As Campaign Coordinator for the World Society for the Protection of Animals (WSPA), Harry worked extensively across Europe and Asia on companion animal population management programmes, rabies eradication projects and animal welfare NGO capacity development. As a Co-founder of Change For Animals Foundation, Harry directs their stray animal population management projects as well as providing organisational and capacity development support for locally based animal welfare organisations.

Harry also works as Companion Animal Programmes consultant for the International Fund for Animal Welfare (IFAW) supporting their companion animal management programmes around the world.

John Friar

John has about 30 years of experience in the I.T. industry as a software designer and developer. John has collaborated on a number of data modelling projects in ecology and epidemiology having developed modelling systems for fire dynamics and elk ecology, and in providing data management and analysis to the UK government during the 2001 foot and mouth crisis. Currently, he is working with epidemiologists and animal welfare agencies supporting the implementation of dog rabies vaccination programs and community participation projects. With experience in both the commercial and non-commercial worlds, John recognized an opportunity to apply modern data management tools and techniques to assist the effective rollout of public and animal health interventions. As founder of Wise Monkey Foundation, John has built a data management and analysis platform that is being utilized by projects in Indonesia, the Philippines, India, Romania, Mexico, Costa Rica, Puerto Rico, and Canada.

Melania Gamboa

Melania Gamboa was born in San José, Costa Rica. She graduated from Kansas State University, USA, with a Bachelor in Science degree in 2004 and a Degree in Veterinary Medicine in 2008. In December of 2011 she received an MBA degree from the Universidad Latina, Costa Rica. Melania has worked in private practice, in a small animal clinic for dogs and cats and also as an independent professional. Since mid-2010 she has been working for World

Animal Protection as Veterinary Programmes Manager for Mexico, Central America and the Caribbean and more recently for all of Latin America. Some of the most important projects that have been under her charge are the decrease and elimination of inhumane mass culling of dogs and cats and the introduction of animal welfare into the curriculum of veterinary medicine universities across the region. She is also World Animal Protection's representative in Costa Rica's National Technical Committee for the Use of Animals in Research. She has been invited to speak in international conferences related to rabies control and animal welfare in dogs and cats such as "Rabies in the Americas, Guadalajara, Mexico, 2010" and the World Rabies Day Forum in Jalisco, Mexico, 2011. Recently she has been in charge of carrying out the Dog Population Management Campaign for her region. Melania has also offered training courses and workshops in animal welfare to professors and directors of veterinary medicine schools in various universities of the region and in events such as the VI National Conference of Veterinary Medicine and Zootechnics "Dr Aline Schunemann" 2011 from the Mexican Consorcium of Universities. She was in charge of Memorandum of Understanding with the Mexican Association of Veterinary Medicine and Zootechnics Schools to work jointly on animal welfare issues. She has also worked to raise awareness on the use of alternatives to the use of animals in education to the universities of the region. Melania was also in charge of coordinating the online courses offered to World Animal Protection's professional audience up until 2014. Melania greatly enjoys reading and spending time with her family and close friends and studying animal cognition and sentience.

Elena Garde

Elena Garde was born and raised in Canada, but now lives permanently in Chile. She has a Doctor of Veterinary Medicine from the Western College of Veterinary Medicine in Saskatoon, Canada and a Master's degree in International Animal Health from the University of Edinburgh. Elena began her career working with wildlife in Canada, and from there, she began her line of research and passionate interest in urban fauna, disease ecology, public health and interactions between humans and animal communities. In Latin America, she has developed a special interest in the issues surrounding free-roaming domestic dogs and their impacts on people, livestock and wildlife. As the Program Director and co-founder of the GAAP, her goals are to develop long term sustainable programs addressing the complex issue of free-roaming dogs.

Rita de Cassia Maria Garcia

Parana Federal University Professor of Collective Veterinary Medicine (Public Health, Legal Veterinary Medicine and Shelter Medicine). Coordinator of Animal Control Officer Courses in Latin America (FOCA Course: itecbr.org), Director of Brazilian Animal Welfare Association (AMVEBBEA) and Brazilian Legal Veterinary Medicine Association (ABMVL), Member of National Council for Animal Experiments Control and National Forum of Animal Protection. Master in public health and PhD in Science for São Paulo University. Postdoc in Animal Welfare. Specialization in Public Health, Clinic Pathology, Homeopathy and Animal Welfare, Member of OIE Animal Welfare Working Group (2006/2007) and member of Expert meeting on Dog Population Management (FAO, WSPA, Istituto G. Caporalle), 2011.

Lindsay Hartley-Backhouse

Lindsay Hartley-Backhouse has been working within the animal welfare industry in Thailand for 5 years within a range of NGOs, but specifically with companion animals in sterilization and vaccination programmes. She currently works for Lanta Animal Welfare in Thailand, in addition to teaching. She is also currently studying for her Masters degree (MSc) in International Animal Welfare, Ethics and Law at the Royal (Dick) College of Veterinary Medicine, at the University of Edinburgh. In addition to companion animal welfare and management, Lindsay also has a keen interest in production animal welfare and welfare ethics.

Dananjaya Karunaratna

Dananjaya (Dana) Karunaratna joined World Animal Protection's Thailand office in April 2010, before taking on his current role as End Inhumane Culling Campaign Manager for Bangladesh. Since then he has been instrumental in supporting the Government of Bangladesh to develop its first National Action Rabies Plan and to begin implementing a nationwide programme of humane canine vaccinations instead of indiscriminate culling in response to rabies. Hailing from a coastal town not far from Colombo in Sri Lanka, where he still resides with his family, Dana studied veterinary medicine and surgery at the University of Peradeniya, Sri Lanka. Dana has a Masters in Wild Animal Health from the Royal Veterinary College and Zoological Society of London, and has undertaken internships on veterinary medicine and surgery at the University of Melbourne, Australia and the University of California Davis, USA. Prior to joining World Animal Protection. Dana worked as a veterinarian, before the 2004 Asian Tsunami propelled Dana to join the relief effort for animals, leading him to work for a number of animal welfare organisations as a field manager for a veterinary team carrying out neutering and vaccinations of dogs.

Pankaj KC

Pankaj KC is the Head of Campaigns for World Animal Protection, leading their efforts to end the inhumane culling of dogs around the world. Pankaj has 11 years' experience of campaigning, advocacy and lobbying for international charities, including roles at WaterAid and Practical Action. At World Animal Protection, he guides regional teams in Asia Pacific, Latin America, Middle East, Africa and Europe, in building robust and stepwise campaigning strategies, aimed at influencing Governments and communities to take action to protect dogs.

Darryn Knobel

Darryn Knobel is Associate Professor of Epidemiology and Population Health, and Director of the Center for Conservation Medicine and Ecosystem Health at Ross University School of Veterinary Medicine in St Kitts. He completed his degree in veterinary science at the University of Pretoria in 1999, and his Master of Science in Zoology in 2002. In 2009 he obtained a PhD from the University of Edinburgh, which received the Centre for Infectious Diseases Ker Memorial Prize for outstanding research in infectious diseases. In 2010 he joined the Department of Veterinary Tropical Diseases, University of Pretoria. He received the University of Pretoria's Exceptional Young Researcher award in 2014, before taking up his current position at Ross University in January 2015. His research findings have been presented at 20 international conferences and he is (co-) author of 27 scientific publications and three book chapters. His research interest is the population ecology and humane population management of owned, free-roaming domestic dogs in underserved communities, as well as the epidemiology and control of infectious diseases in these populations.

Dunja Kovac

She was born 08.07.1981 in Novi Sad, Serbia. She finished Agricultural University of Novi Sad, Department of Veterinary Medicine, where she got degree - Doctor of Veterinary Medicine (DVM). At FDF - Farm Development Foundation, she is a Leader of Animal Welfare Programme - regarding the problem of stray dog population in Serbia and animal welfare standards. At FDF she founded Educational Center "Pets & Science" where her main field of work is behaviour problems of pets. She studied under Dr Sophia Yin in the field of Applied Animal Behavior. With the ASPCA she became certified to implement MYM and SAFER programmes for shelter dogs and cats. With Messerli Research Institute in Vienna she did her work in comparative cognition in dogs and wolves. At the "Academy of Cynologique" in Belgrade, Serbia, she is a lecturer in the field of Applied Animal Behavior.

Joy Lee

Joy Lee is the Senior DPM Program Manager for Humane Society International (HSI) - Asia, currently based in India. Lee holds a Bachelor of Science degree in Ecology and Conservation Biology from the University of Texas at Austin and a Juris Doctor from the Northwestern School of Law at Lewis & Clark College, Portland, Oregon. Prior to joining HSI, Lee worked at the World Society for the Protection of Animals (WSPA) U.K. - now World Animal Protection - where she was responsible for networking and capacity building of local animal welfare organisations throughout Europe, in particular the southern and Eastern European countries, as well as managing the regional grants program. She also had oversight of companion animal projects in Europe. At HSI, Lee has focused on developing a new initiative to promote compassion and animal welfare in local project staff and local communities of Animal Birth Control (ABC) programs, including a new training program on Welfare and Humane Handling and new protocols for community engagement for human behaviour change. Under this initiative, in the city of Jamshedpur, she piloted the first high-volume ABC program with a unique methodology of hand-catching. She currently oversees the DPM projects of HSI in India.

Hanna Lentz

Hanna Lentz is the Global Program Officer for IFAW's Companion Animal Program. She focuses on management, strategic planning, monitoring and learning for their projects and initiatives around the world. Current work includes various program development, facilitation and management efforts for community-based projects in Mexico, South Africa, Chile, Bosnia and Canada. She is also a Senior Fellow of the Environmental Leadership Program (ELP) which develops US-based leaders focused on social and environmental justice. Previous experience includes the World Society for the Protection of Animals (WSPA, now World Animal Protection), The Washington Humane Society, the Massachusetts Society for the Prevention of Cruelty to Animals (MSPCA) and SASHA Farm Animal Sanctuary. She has an Honours degree in English Language and Literature from the University of Michigan, a Master of Science in Animals and Public Policy from Tufts University, and is currently working towards a Global Masters of Business Administration from IE University in Spain.

Kati Loeffler

Dr Kati Loeffler completed a doctorate in veterinary medicine (DVM) in 1989 and a PhD in 1996, both in the United States. Her veterinary expertise includes a variety of domestic animals, as well as bears, red pandas and birds of prey. She worked in China for 10 years as researcher with the Smithsonian Institution and the Chengdu Panda Breeding Base in diseases of giant pandas and red pandas, as veterinarian for the Animals Asia Foundation's sanctuary for bears rescued from the bear bile industry, and as veterinary and scientific advisor for the International Fund for Animal Welfare (IFAW) in Beijing. She now works internationally with IFAW, based at the organization's U.S. headquarters. Her work focuses on improving the welfare of domestic animals and captive wildlife, and in capacity building for local veterinary staff and animal caretakers.

Brighton Marienga

Brighton Marienga is currently the sub-county veterinary officer in charge of Westlands, Nairobi County. He holds a master's degree in Environmental studies and Community Development from Kenyatta University and a Bachelor of Veterinary Medicine (BVM) from Nairobi University. He is actively involved in designing and implementing various animal welfare programs, dog population management strategies and general animal welfare issues within Nairobi County for the last four years. He has worked in close collaboration with regional animal welfare organisations working in Kenya including African network for animal welfare (ANAW), Kenya network for dissemination of agricultural technologies (KENDAT) and World Animal Protection in implementing dog population management strategies in the recently devolved government systems in Kenya.

Aung Swi Prue Marma

Resident Medical Officer, Bandarban Sadar Hospital and ex. Focal Point, National Rabies Elimination Center Dr Aung Swi Prue Marma, Resident Medical Officer of Bandarban Sadar Hospital, graduated in Medicine from Chittagong Medical College in 1991 and obtained MPH from the University of New South Wales, Sydney, Australia in 1997. Dr Marma was awarded PhD in Tropical Medicine from Tokyo Women's Medical University, Japan for Molecular characterization of Malaria Drug resistance genes. Dr Marma started his career in a hilly district Bandarban where he spent 11 years involving malaria clinical practice and research activities. He is a malariologist and WHO/TDR trained Clinical Monitor who has joint collaborative research works with joint collaboration of iccddr'B, Mahidol University (Thailand), Medical University Vienna (Austria), John Hopkins University Maryland (USA), Tokyo Women's Medical University (Japan). In 2010, he joined CDC, DGHS, Bangladesh, as Deputy Program Manager and Focal person at national rabies elimination centre. Dr Marma initiated rabies control activities for the first time in the country at the government level by introducing TCV at infectious disease hospital, Dhaka and stopping

NTV use. Mass Dog Vaccination (MDV) was first piloted at his leadership at Cox's Bazar and then scaled up to all district municipalities in the country. He was co-author for many guidelines, training module and SOP notably communicable and neglected tropical diseases at CDC, DGHS. Dr Marma also coordinated a number of training programs, seminars and workshops at national and international level. At present, he is working as Resident Medical Officer and Key Official of 100 bedded district hospital. He has got over 10 publications at international reputed journals. His fields of interests are Tropical Infectious Diseases, rabies, medical tourism, travel health and healthy city initiatives. His dream is to eliminate rabies from Bangladesh and create a safer and healthy environment for future generation.

Stefano Messori

Stefano Messori graduated with honours in Veterinary Medicine (DVM) at the University of Parma, Italy, in 2006. After graduating, he worked as meat inspector in pig and cattle slaughterhouses for the Italian Local Health Service. In 2011 he defended a doctoral thesis titled "Dietary strategies to minimize the detrimental impact of weaning on gut morphology, physiology and microbiota of piglets". Since 2011 he works as a researcher on animal welfare at the "Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise", OIE Collaborating Centre on Veterinary Training, Epidemiology, Food safety and Animal Welfare. His current research topics focuses mainly on the use of animal-based measures for the in-field evaluation of animal welfare and on innovation applied to dog population management. He is tutor at several DG-SANCO BTSF training courses for official veterinarians on animal welfare and participated as an expert in the TAIEX Multidisciplinary workshop about stray animals in Serbia (2013).

Katherine Polak

Dr Katherine Polak currently serves as the Director of Animal Welfare at Soi Dog Foundation in Phuket, Thailand. Soi Dog is the premiere agency working to combat the cruel dog meat trade in Southeast Asia and conducts a national sterilization and vaccination campaign for stray dogs and cats. Dr Polak's interests include stray animal management, high-volume, high-guality spay neuter, and feline infectious diseases. She is a Diplomate of the American College of Veterinary Preventative Medicine and a former resident in Shelter Medicine at the University of Florida Maddie's® Shelter Medicine Program and a former intern in Shelter Medicine and Surgery at Colorado State University. She has also earned a Master in Forensic Science and a Master of Public Health.

Syed Israr Shah

Syed Israr Shah is a Ph.D. scholar in the Zoology Department of PMAS, Agriculture University, Rawalpindi (Pakistan). Since 2009 he has been studying the population ecology of dogs for his doctoral thesis in different habitats (viz. city, towns, and villages) of District Rawalpindi, Pakistan. For his M.Phil. (Zoology) degree, he studied impact of vulture depletion on the ecology of Pothwar (Pakistan) (This project was funded by HEC, Pakistan). Presently, he is writing his Ph.D. thesis for submission and necessary processing to the university.

Christina Siettou

Christina Siettou is a Research Fellow at Defra investigating the Economics of Biosecurity within animal health and welfare. Prior to this appointment she was an Assistant Lecturer at the University of Kent at the School of Economics, Canterbury Campus and at Kent Business School, Medway Campus. She has completed a PhD in Agri-Environmental Economics and holds an MSc in Applied Environmental Economics, both from the University of Kent, and a BSc in International and European Economic Studies awarded by the Athens University of Economics and Business.

Abstracts: **Keynote Addresses**

From Paragon to Pariah: Cross-cultural Perspectives on **Dog-Human Relationships**

James A. Serpell Center for the Interaction of Animals & Society School of Veterinary Medicine, University of Pennsylvania, Philadelphia, USA.

The modern animal protection movement emerged in northern Europe and eastern North America during the Nineteenth Century. Increasingly, however, its sphere of interest has expanded to encompass other regions of the world and other cultures where attitudes and behaviour towards animals such as dogs are often very different. Understanding these cultural and regional differences in attitudes and behaviour towards dogs plays a critical role in humane dog population management efforts. This presentation will explore the remarkable cultural diversity of human attitudes of dogs, as well as considering possible approaches to initiating positive changes in attitudes.

Daniel Stewart

Daniel has had an extensive career in animal welfare, working in South Africa and throughout other parts of Africa for a period spanning over 20 years. He joined the Bill and Melinda Gates Foundation Rabies Elimination Project in 2009 as a primary animal health care coordinator to run the welfare, research and training component of the project. Daniel has an advanced diploma in companion animal behaviour and he has spent a great deal of time studying free roaming dogs, mainly within the rural areas of South Africa. His expertise has been utilised by several organisations globally, with the emphasis being on dog population management, rabies elimination programs and animal handling training. When he is not travelling he runs his own dog training centre and is in the process of writing his first book on village dogs.

Louisa Tasker

Dr Louisa Tasker, has a strong professional and academic commitment to understanding and enhancing animal welfare in real world situations through the practical application of scientific research and knowledge. She completed her PhD at the University of Stirling in 2012. Using multidisciplinary methodologies and evidence-based approaches Lou developed a welfare assessment tool for captive longtailed macagues, and refined housing and husbandry practices to enhance their welfare. Prior to her PhD studies, Lou was a programme manager and external consultant for the companion animals department at World Society for Protection of Animals, contributing to humane dog population management programmes of work. Lou has contributed to resources and guidance documents for the International Companion Animal Management (ICAM) Coalition, including the most recent guidance entitled 'Are we making a difference?

An Overview of Non-Surgical Fertility Suppression/Sterilization of Companion Animals

Linda Rhodes Aratana Therapeutics, Inc. 1901 Olathe Boulevard Kansas City, KS 66103 1-844-ARATANA (272-8262)

For more than 30 years, researchers have tried to develop a non-surgical method of suppressing fertility, or sterilizing cats and dogs. Given that spay/neuter is labour intensive, costly and logistically challenging in many countries, a nonsurgical alternative has been sought that would be an effective tool in dog and cat population management.

Only a decade or so ago, there were no non-surgical alternatives approved for cat or dog use. Now there are a few approaches commercially available, and due to a significant infusion of research funding from the Michelson Prize and Grants program, the brainpower of human biomedical sciences has been turned toward providing solutions that could provide real progress in non-surgical fertility suppression and/or sterilization.

This talk will review the main approaches currently be researched, and provide an update and what is known and what may lie ahead. Approaches include improved long-acting GnRH passive and active immunity, toxins linked to targeting proteins that kill only the cells required for reproduction, high dose or long term GnRH agonists, gene silencing and gene therapy approaches.

In addition to these potential tools, an ecosystem of supporting technologies and information will be required for successful deployment. For example, technology to mark treated animals to avoid re-treatment, population modelling to understand the impact of various duration treatments on dog and cat populations, and a solid evaluation of potential costs for realistic resource allocation in the future. Organisations, such as the Alliance for Contraception in Cats and Dogs, are paving the way for the successful introduction of new these new approaches to managing companion animal populations. Let's be ready for success!

Rabies and the Rural Thai Community - Combatting Myths through Education

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Although on the decrease throughout Thailand, human rabies cases are still occurring unnecessarily, though infection from the canine reservoir. Rabies knowledge within the rural community in Thailand is often limited and influenced by a variety of myths, which often prevent the correct post-exposure prophylaxis being sought. The myths also promote ineffective, non-scientific advice, for example, that eating the liver of the biting dog prevents rabies transmission. Myths like these not only risk negatively affecting human health, but also raise welfare issues for the dogs concerned, particularly when inhumane methods are employed to catch and kill them due to misconceptions.

Throughout the second half of 2014, the author undertook to survey the local inhabitants of Koh Lanta, in southern Thailand - where Lanta Animal Welfare is based - to determine whether the rabies myths previously identified several years ago by Thai health officials were still relevant. With the findings of the survey, and by combining scientific evidence about peak bite occurrences within children, an educational campaign specifically targeting children was created on the island in order to combat inaccurate rabies myths, promote bite avoidance and offer practical, accurate scientific advice to those potentially exposed to rabies.

The educational campaign is currently underway, prior to the peak bite period of the October school vacation, and students are being encouraged to take educational material home with them, and share this with parents. Once the educational program is completed, surveys will be re-taken throughout the island to measure the efficacy of the program in educating those most at risk from rabies transmission and improving their knowledge of rabies, bite avoidance and the correct post-exposure prophylaxis. By focusing on specific myths, the program can target the most serious gaps in knowledge and promote both human safety and a better understanding of rabies (or lack of it) within dogs. It is expected that the 2nd survey findings will show an improvement in rabies knowledge on the island - findings will be known in early 2015, prior to the conference. The 'myth targeting' approach could be used in other countries to specifically focus on the most significant canine rabies misconceptions, to benefit both human and canine wellbeing.

The UK public's perceptions on the issue of the dog overpopulation problem and peoples' willingness to pay (WTP) for a humane stray dog management

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The present study surveyed a UK representative sample of 500 individuals and employed the Choice Experiment (CE) to elicit the UK public's views on the management of stray dogs and people's willingness to pay (WTP) to reduce the current euthanasia rate. The results revealed that people have an emotional bonding with companion animals and are willing to pay to reduce the current euthanasia rate. According to the findings the UK public believes that the current stray dog management of euthanizing the un-homed dogs is of grave or moderate concern and appears to be keen on the imposition of welfare-improving policies such as dog licensing, compulsory micro-chipping, etc. In addition, the CE investigated people's willingness to pay (WTP) on a monthly basis to extend the current stray dog seven day statutory period in order to reduce the euthanasia rate. By constructing two payment methods, those of a Voluntary Contribution and of a Mandatory Council Tax Charge the study revealed that people are willing to pay £5.83 per month for small cross/mixed breed dog under the Voluntary Contribution regime and £2.14 per month for a young dog under the Mandatory Council Tax Charge regime.

Five Key Messages for the Prevention of Dog Bites Material

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Rabies is one of the largest drivers for inhumane dog culling around the world. Even in parts of the world where canine rabies has been relatively well controlled, such as in Latin America, fear of rabies and fear of dog bites and aggression is still a cause of cruelty and mistreatment of dogs.

Culling is not only an animal welfare issue but also an inappropriate measure to control rabies. There are several examples around the world where culling in response to rabies has failed. Other measures, such as mass dog rabies vaccination and education about responsible dog ownership, are needed in order to tackle this fatal, but preventable, disease. Education is also an important component in terms of the appropriate treatment and ownership of dogs as well as for bite prevention.

In 2013 World Animal Protection, with support from PAHO and GARC, created a poster for children called "The Five keys for the Prevention of Dog Bites". This was to be used in schools to teach children about dog bite prevention. After a focus group and workshop attended by teachers and children between the ages of four and 12 in Costa Rica, it became clear that a poster on its own was not an appropriate resource to promote safe interactions with dogs and prevention of dog bites.

The findings indicated that a more robust and flexible kit was needed for teachers to utilize when teaching children of these ages. The new "Five Keys for the Prevention of Dog Bites" material is a kit that includes a teacher's guide with information on dog bite and rabies prevention, a poster and a banner with the summarized key messages, A4 sized illustrations to use in class, as well as five mini videos that show each key message visually. These educational materials will not only help with bite prevention but also promote increased awareness of the benefits of responsible dog ownership and basic care of suspected rabid dog bites.

The next step in this process is to test the efficacy and impact of the entire kit in strategic pilots across Latin America, both on the children's knowledge and application, and the prevalence of dog bites.

Development of integrated and humane management solutions to diminish negative effects of free-roaming dogs on a Chilean Patagonian community

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In the Magallanes region of the Chilean Patagonia, there are a number of serious dog-associated problems that affect public and animal health and welfare, such as hydatid disease transmission and aggression towards people and livestock. The general picture within the community is one of frustration, conflict and blame.

Unfortunately the default strategies of sterilizing or removing dogs have not been effective at addressing the root-causes of the problem. Furthermore, cultural and community-specific subtleties directly affect the potential for success of any intervention; therefore, strong inter-sectoral collaboration is essential to the development and implementation of a successful management plan.

Drawing on proven strategies used in resolving conflict between people, their environment and community development we developed and facilitated a series of workshops to engage community support for humane dog population management in Puerto Natales, Chile. The overall objective of these workshops was to introduce innovative tools to the community stakeholders so that they could develop and test their own solutions. The specific aims of the two workshops were 1-to gain a novel insight into the current situation and the community perspectives and 2- to design a community action plan based on agreed upon priorities. Stakeholders in this southern community have now aligned their collective agendas toward the implementation of their plan comprising four concrete and measurable objectives, including a 10% reduction of dogs in the streets, a 10% increase of dogs being maintained in owners yards but living in acceptable conditions, and a 50% increase in general knowledge in the community about the role of dogs in hydatid disease and the municipal canine bylaw.

The upcoming year will see the plan unfold and participants will monitor the project as a whole and evaluate each of the objectives throughout the process. Their hope is to develop this pilot project that will work in the unique environment of their community as a way to change human behavior, thus addressing this problem in the long term. Already we have witnessed change in the way in which different members of the community view the problem; instead of arguing over points of view, polarized groups have found common ground. The working group has identified innovative ways to deal with the problem, putting the emphasis on people and requiring that owners assume accountability for their own dogs. We report here on our methodologies, experiences gained, problems encountered and successes to date in this unique southern community experience.

Assessment of free-roaming dog health and evaluation of knowledge, attitude and practice of dog owners to canine rabies in Chitwan District, Nepal.

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In Nepal canine rabies is endemic and every year circa 200 people die after contracting this disease from free-roaming dogs. A study was carried out in Chitwan District in Central Nepal, to assess knowledge, attitude and practice of dog owners towards rabies and dog population management, to evaluate rabies vaccination coverage and response to rabies vaccination in free-roaming owned dogs and to assess dog health through health profiles, body condition scores, haemoprotozoa parasites, endo- and ecto-parasites.

Household face-to-face interviews were carried out with dogs owners or carers (n=60). The guestionnaire sought information on dog owners' association with dogs, knowledge, attitude and practice of dog owners towards rabies and demographic data on female dogs. All study dogs (n=60) were administered the rabies vaccine Biocan R, routinely used in the region. Males and puppies were also administered rabies vaccine if owners requested it. Blood, skin and faecal samples were collected for health profiles and parasite identification. The results showed that 92% of dog owners were aware of rabies transmission but only 47% were aware of the correct post-exposure prophylaxis and only 27% of pre-vaccinated dogs had adequate serum antibody titers (> 0.5 IU/ml). Vaccination resulted in 97% of the dogs maintaining adequate serum antibody titers for at least 6 months postvaccination. Free-roaming owned or community-owned dogs appeared generally healthy, with an average age of 3.7 years old and body score index close to "ideal". Haemoprotozoan, endoparasites and ectoparasites were found in 11.6%, 73.3% and 18.3% of the dogs respectively. Out of 60 bitches, 70% had litters in the previous 12 months, with a mean litter size of 4.5 (SD 1.6) pups per litter. Births occurred between September and February, with a peak in November.

We concluded that the low vaccination coverage in dogs and the relatively poor awareness of post-exposure prophylaxis required increased effort towards educational programmes targeted at dog owners to increase their level of knowledge and reduce the risk of exposure to rabies. The presentation will share some lessons learned, on practical issues, that might be relevant to others engaging in a similar study.

Community trust and engagement are necessary for resilience in a Rabies outbreak

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Intervention to achieve effective and humane dog population management requires a strong relationship with the community. The same is necessary for an effective rabies campaign. This is illustrated by a case study that compares responses by two groups to a rabies outbreak in Soweto, South Africa.

In September 2010, the Department of Agriculture (DoA) set up free rabies vaccination points (VPs) from 9AM-2PM in various locations, e.g., outside shopping centers. Flyers about the campaign were distributed through the mail. People who presented their dogs at VPs were not asked about the health or history of their animals, nor were they counseled about rabies. They were also refused advice on incidental veterinary issues.

A door-to-door survey of 132 households (158 dogs) was carried out in one township to understand why the DoA's VPs were poorly attended. Over 5 days, VPs vaccinated 19 (12%) of the 158 dogs, utilizing only 3 of the 8 VPs. Residents said that they had not attended the VPs because they hadn't known about the DoA campaign (42%) or that they were at work or school during the VP hours (22%). Additional reasons included inability to get to the vaccination point or trouble handling dogs to bring them there.

In the same township, CLAW vaccinated 484 dogs in 3 days. CLAW's approach was to mobilize the community, with which it has a strong relationship. School headmasters agreed to mobilize students, who in turn mobilized their neighborhoods to bring dogs to VPs at the schools. VPs were set up at human clinics, and nurses organized presentations by CLAW on rabies prevention. CLAW engaged squatter camps by first visiting with householders, and the following day vaccinating animals who residents brought to the mobile clinic. CLAW took calls day and night from community members with rabies concerns, and investigated each case despite a large volume of false alarms. It ensured that human dog-bite victims received appropriate medical care. Within a month, CLAW had vaccinated more than 3000 dogs and hundreds of livestock in addition to its regular veterinary and animal welfare activities. There were no incidents of rabies-associated panic in these communities that might have resulted in animals being killed or abandoned.

Although a vaccination drive may seem a largely technical undertaking, community participation is imperative not only to its success, but to prevent public panic and associated animal cruelty.

Dogs are a development issue: The social impacts of roaming and poorly managed dogs on human communities

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Roaming and poorly managed dogs cause a wide range of problems, from nuisance to psychological distress, fear and public health concerns. A review of data from dog population management (DPM) projects reveals that the majority of interventions limit their definition of success to dog-related factors (dog population size, health, welfare), zoonosis reduction, and public attitudes toward dogs. Individuals living in affected communities, however, have expressed a host of additional social concerns resulting from the presence of poorly managed dogs, from sparking conflict between neighbors and social groups to inhibiting physical activity and commerce. Because of the multi-sectoral importance of such issues, this study set out to document the broad-reaching social impacts that problematic dogs have on communities.

We conducted a literature review for dog population management projects reporting human-related impacts, and conducted 41 field expert interviews to identify and categorize human-related impacts of dog "problems" on communities. We then conducted a broad review of literature on a range of topics relevant to community development and social welfare, to better understand the impacts described by DPM experts. We found that the social impacts of dog problems fall into four broad categories: social capital; quality of life; (in)tolerance and the human-animal bond; and economic impacts. Additionally, we found that attempts to address dog problems may have benefits beyond merely eliminating dog-related issues; interventions may build positive social capital, improve the walkability and desirability of communities, build participation and trust in governance structures, and spark enthusiasm to address social ills unrelated to dogs. Physical and emotional benefits may result, from enhancing the benefits of positive connections with animals to promoting outdoor activity. These findings are underpinned largely by three distinct social theories described in the literature: the Intergroup contact hypothesis, the "broken windows" phenomenon and the "Link".

We will discuss our findings in detail, including the negative social impacts of poorly managed dogs and their significance to community development and social welfare, as well as recommendations for DPM interventions to maximize their positive social impacts. Based on the findings of this preliminary study, we suggest that dog population management may be of interest to a far broader set of stakeholders than previously engaged. Further, we suggest common social impact measures which interventions may incorporate to help document the important connection between dog welfare, social welfare and the development communities.

A people centered approach to dog population management

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Conventionally, model animal welfare and dog population management strategies have included the provision of materials, resources and trainings to target communities. These model interventions are typically supported by expertise and resources from outside the community, and many communities may struggle to adapt these models or continue them when external funding and expertise has moved on. Drawing on lessons from the human health, development and conservation sectors, we have sought to develop a model which empowers communities to address their own dog population management concerns humanely and sustainably, drawing primarily on local resources.

The divisive nature of community challenges with dogs, and conflicts around the strategies to address them, requires a cross-sectoral approach to ensure humane outcomes. IFAW has developed a participatory community support process to engage and empower local stakeholder groups to develop a shared understanding of their community's concerns, assess dynamics of dogs in their community, and develop a locally-owned and implemented management strategy. We have pilot tested this approach in five communities - four communities in Bosnia and one in Chile - monitoring for animal welfare, community welfare and community engagement outcomes.

While it is too early to report quantitative animal welfare outcomes, qualitative measures will be reported including the commitment to humane plans, key stakeholder groups refraining from implementing inhumane management measures, and measured community responses to previously inflammatory incidents. Stakeholder interviews and surveys indicate improved stakeholder commitment and optimism regarding dog management challenges. Finally, approved and implemented community action plans indicate that this facilitated and structured process can build cross-sectoral consensus and collaboration around dog population management issues. These preliminary results also suggest that dog population management plans in select communities will endure with the support of local resources. The design of the process will be discussed as well as how it was received by the communities by which it was requested. Results in the five communities will be contrasted, with analysis focusing on the type of management strategies that were chosen, the realigning of community resources that occurred and the changes in stakeholders' feelings about their ability to impact their own future. We will also suggest criteria for where this approach may be most successful.

This analysis suggests that the welfare of dogs and people can be improved through investment in community-wide engagement first and foremost, which suggests the potential benefit of a shift in mindset and investment stricture in the dog population management field.

Dog population management in Vietnam

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Vietnam is an ASEAN country with a very high population of Domestic dogs distributed across the nation. While pet ownership is increasing in Vietnam, with a small number of exotic dog breeders in urban areas, the majority of dogs are currently local breeds kept as household guard dogs, or bred for human consumption. The highest dog population is found in the delta regions, and in cities and towns. While most families keep only one dog, some have up to 3 or 4, and many households keep dogs in conjunction with cats. The total dog and cat population is currently estimated to be about 8 million. Management of dogs and cats, including rabies monitoring, from province to district and commune levels, remains weak. Many dogs are kept unrestrained, and able to freely scavenge and roam, with few wearing collars or muzzles, a low level of rabies vaccination, and no animal registration to competent authorities or veterinary officers.

Rabies is an endemic disease in Vietnam. During the last 5 years, there have been approximately 100 human fatalities from 20 to 30 provinces (out of a total of 63 provinces) annually. 96% of human cases are believed to be related to contact with dogs, 3% cats and 1% other animals. The Northern mountainous provinces are identified as the highest risk areas for rabies infection. In 2013, human rabies cases were reported for each month, with 103 fatal cases from 26 provinces where patients were not provided with post-exposure vaccination. The total number of fatalities was higher in 2013 compared from 2008 - 2012, although some provinces (10/63) reported a reduced case number, with 95% of fatal cases monitored and investigated.

Rabies surveillance is implemented by the Department of Animal Health (DAH) at a central level, with support of provincial Sub Departments of Animal health, District Veterinary Stations, Commune People's Committees, Heads of villages, commune animal health workers and dog owners themselves. While 72 cases were reported for dogs in 2011, mainly in the Northern mountainous region, the common habit of allowing dogs and cats to roam and scavenge free within villages means that the number of reported outbreaks is likely to underestimate the true number of outbreaks in Vietnam. Additionally, most investigations in dog populations were reactive, and occurred only after a human infection was reported.

Vietnam has implemented a dog vaccination program, with two rounds of vaccination implemented annually (April – May and September – October). It is estimated that around 50-60% of the total dog and cat population are currently vaccinated against rabies, with more than 90% vaccination coverage in urban areas, compared to less than 50% coverage in rural and remote regions. It is believed that the free-ranging nature of many dog populations in Vietnam, ineffective vaccination and poor awareness of rabies amongst the general population are the main constraints in the disease control and prevention program.

From 2011 to 2015, the Ministry of Agriculture and Rural Development (MARD) will cooperate with the Ministry of Health (MOH) to implement the National Program on Rabies Control and Elimination. This program aims to strengthen support of local authorities and professional offices, and to effectively utilize financial and technical assistance of international organisations. The objectives of this program are:

- To improve awareness of people and community on rabies and the disease control and prevention.
- To improve the quality of rabies surveillance system in both humans and animals.
- To register 80% of dog population
- To have 80% of dog population vaccinated against rabies.
- To have resulted in a 30% reduction in human fatalities, compared to the average period 2000-2011, by 2015

To have 80% of provinces in whole country free of rabies in animals. Vietnam has already seen some success. A recently established model of dog management has resulted in 50 communes and wards in Ho Chi Minh City certified free rabies by the Department of Animal Health in Viet Nam. This rabies free model will now be applied over the entire country.

With the help of FAO, Vietnam is developing model projects rabies in 2 northern mountainous provinces, including communication activities to raise the awareness of the people.

- Animal owners must register the dog with the local government
- Dogs must be wearing a collar, lock link in the campus family.
- Every year dogs must be vaccinated
- Strengthening surveillance system for rabies, coordination between animal health and human health early detection of suspected rabid dog and timely response to outbreaks of rabies have occurred .

It is hoped that these collaborative efforts between the Ministries responsible for human and animal health will result in a considerable improvement of rabies control in Vietnam in the future.

Dynamics of an owned, free-roaming dog population: implications for population management

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Understanding the population dynamics of free-roaming dog populations, particularly the core demographic rates of birth, death and migration, is important for the development of evidence-based solutions for dog population management in underserved communities. Despite the ubiquity of free-roaming dogs in sub-Saharan Africa, little is known about the demographic rates of these populations, or the factors that affect them. Evidence from a number of studies in the region has shown that, despite appearances, the vast majority of dogs (>90%) in these populations are owned. Demographic surveillance of dog populations is therefore possible through ongoing monitoring of individuals within households. Here, we report the results of a demographic surveillance system in an owned, largely free-roaming dog population in a community of around 10,000 people in 2,000 households in Hluvukani, Bushbuckridge Local Municipality, Mpumalanga Province. Following an initial census, regular visits (every 4-5 months on average) were made to all households within the designated surveillance area. During these visits, information on individual dogs was updated, including key demographic events. Data are presented here, spanning 32 months (1st January 2012 through 1st July 2014) and covering over 2,000 dog-years of observation.

The number of owned dogs in the demographic surveillance area was exactly the same (791) at the start as at the end of the study period. However, during this period there was a substantial fluctuation in this population, reaching a peak of 955 dogs in the last guarter of 2012 followed by a sharp decline in 2013 to 711 dogs, and recovery in 2014. The annual growth rate was 19% in 2012 and -24% in 2013. Birth rates were extremely high: the crude birth rate was 451 dogs per 1,000 dog-years in 2012 and 314 dogs per 1,000 dog-years in 2013. There is evidence of seasonality in birth rates, reaching an annual peak in autumn (March-June). These seasonal birth pulses appear to drive the dynamics of mortality and migration through death and movement of puppies. The crude death rate was 408 dogs per 1,000 dog-years in 2012 and 569 dogs per 1,000 dog-years in 2013. There was a sharp spike in the mortality rate in the second quarter of 2013. The sex ratio of the population was strongly male-biased. It remained stable during 2012, ranging from 1.37 to 1.39 male dogs per female, but increased steadily in 2013 to 1.75 by the end of the year, largely due to significantly higher mortality rates in females.

Sterilizing more than 80% of female dog population: Is it enough to keep the population under control?

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One main threat to welfare of dogs is the increased number of roaming dogs on streets. Colombo, the commercial capital of Sri Lanka was no exception. Although most roaming dogs in Colombo were fed by somebody, no one took ownership or responsibility. Therefore, dogs proliferated and lived in extremely poor welfare conditions. The local authorities caught (nooses) and culled them as a measure of population control for more than 100 years. The "No-kill Policy" was introduced by H. E. President (2006) without an alternative in place.

The Humane Dog Population and Rabies Management Project, Colombo, was initiated in response to this situation. A survey carried out in 2007 in seven sample wards (out of 47 wards) of Colombo Municipal Council (CMC) area revealed 5,737 roaming and 15,640 owned dogs and a population increasing at a rate of 18%, without any intervention. During the next five years, 80% (4,809 dogs) of roaming female dog population in all 47 wards was sterilized surgically. This resulted in a population decrease at a rate of 9% at the end of the project in December 2012.

Since January 2013 Colombo dogs' destiny has been decided by the ward they are living in. Dogs in key, economically important wards were removed and dumped in remote areas as part of "City Beautification", dogs in nearby wards caught and sterilized by CMC (as continuation of the project) and BPT (for student surgery training) and dogs in distant, "unimportant" wards ignored. BPT carried out roaming dog counts in sample wards in end 2014 to review the long term impact of 80% female dog sterilizations, given the variety of recent interventions; with a view to assess current population dynamics. In Ward 1 and 47 sterilized percentages have gone down from 83 to 59 and 100 to 75 respectively although authors believe there were no interventions by CMC or

BPT due to distance and demographics. In areas where sterilized animals were removed, instead of the outcome expected by authorities, i.e less dogs, in fact the population actually increased further due to immigration by unsterilized dogs from neighboring suburbs resulting in increased reproduction. In areas with ongoing sterilization programs the populations were stable or decreasing.

Sterilized percentages going down in areas with initial 80% sterilization and no further interventions may be due to dumping of pups from adjoining non CMC areas as many residents complained. However needs further studies to confirm.

Are DPM programmes targeting the source of FRDs? A 13-years retrospective study

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Free roaming dogs (FRDs) are often a consequence of overpopulation, which in turn results from the lack of control of dog reproduction. The Italian national framework law provides general principles for the control of FRDs and forbids euthanasia for dogs, unless they are affected by incurable disease or of proven aggressiveness. Each region regulates the control of dog overpopulation though local laws. This study was carried out in the Abruzzi region, where a trap-neuter-release policy is adopted. The aim was to investigate if the dog population management (DPM) system in place was being effective. A retrospective study was carried out, analysing data recorded during a thirteen years period (2000-2013) in a public shelter managed by the official veterinary authority in the Pescara province. Overall, 7,475 dogs entered the shelter in the investigated period, 71% being females and 77% being mongrels. Release on the territory and adoptions were the main destinations for caught dogs. The average number of dogs entering the shelter annually was 530, being stable through the period. On average, 381.7±34.7 (mean±ds) sterilisations were performed yearly. Only 9% of the caught dogs were owned (ODs) that had escaped or that were left free to roam on the territory. During the study period, the dog average age decreased yearly, highlighting a rejuvenation of the population. Alongside, it was observed that already neutered ODs were only 4.2% and identification was not implemented in 38.2% of cases. Allowing entire owned dogs to roam free increases the possibility to meet other FRDs (i.e. potential partners) thus increasing the stray dog population. The lack of decrease in the number of entrances/year and in the neutering rates across the study period, highlight a gap in the current DPM system in targeting the source of FRDs, suggesting that neutering plans alone are not sufficient to manage the FRD population in the area. In order to achieve an efficient control of FRDs population, strategies to improve responsible ownership together with the sterilisation of owned dogs and custody of ODs, particularly in areas where those are allowed to roam, should be implemented.

Dog Population Management in Jamshedpur, India: a model for improving welfare and achieving impact through human behaviour change

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Dog population management (DPM) projects in developing countries face major challenges in ensuring animal welfare and achieving impact. The recruitment of local project staff is a key factor, as knowledge of animal behavior sciences is limited and compassion towards animals is not a widespread social value. Poor animal welfare manifests throughout DPM project activities including cruel catching techniques, over-use of force in handling, low awareness of welfare in environments such as inside vehicles or kennels, low quality of post-operative care, and not returning dogs to the location from where they were taken. Achieving impact is rarely visible nor widely reported due to poor data management and lack of effective monitoring and evaluation.

A DPM project piloted in Jamshedpur, India, since July 2013, sought to address these challenges through a new approach that places community engagement and human behavior change at the center of the conventional animal-focused activities. Recruited project staff first attended a mandatory 5-day workshop on Compassion and Dog Behavior, followed by 1 week of practical training. Compassion and understanding of dog behavior was then enforced through the implementation of dog behavior surveys and a new hand-catching protocol, both of which provided staff sustained exposure to emotionally rewarding interactions with the dogs to strengthen the animal-human bond. In addition, the behavior surveys and the hand-catching technique were also a visual tool designed to promote compassion and reduce human-dog conflict in the community.

A newly developed data management system - including a mobile application for data collection, photographic documentation and GPS tracking - was also implemented to provide daily monitoring of welfare and impact. Every dog caught is photographed so that humane handling is documented. The GPS coordinates of each catching location is also recorded and later used to generate a Release map, ensuring that the dogs will be returned to the exact location from where they were collected. Navigation for catching and release is directed by Google Maps and tracked through the mobile phone. In addition, the data system can generate pictorial summaries of all activities to-date, providing an easy-to-use tool for monitoring as well as sharing and reporting of results and impact.

The Jamshedpur DPM project is a model for a new humane and strategic approach, focusing on instilling compassion in local staff and communities, all the while being able to reach impactful targets and demonstrate visible results.

Population size estimates for street dogs; the good, the bad, and the shortcuts

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There is now a broad and growing appreciation that it is critically important to incorporate a well-designed field monitoring component within dog population management programs. Monitoring data not only allow for an objective assessment of management impact, but also provide ongoing feedback that facilitates timely programmatic course corrections. At the most basic and fundamentally-important level, a monitoring program consists of an initial baseline survey followed by periodic re-surveys using a standardized dog counting protocol. In addition, many program managers seek to obtain a pre-treatment population size estimate for street dogs within their project area. Having a reasonably accurate estimate of dog population size permits the program manager to calculate the approximate number of sterilizations required to reach a specified population goal within a specified time frame, and to determine associated budgetary and resource needs. Population size estimates can also be useful when considering the relative merits of different management approaches (for example, use of standard surgical sterilization vs. emerging non-surgical options) in a particular setting. A review of attempts to estimate street dog population size, however, reveals frequent problems, including statistically inappropriate extrapolation of survey results, failure to invoke appropriate correction factors, systematic sampling biases, and violations of methodological assumptions. As a result, independently-derived population size estimates for the same area can be highly inconsistent, sometimes differing by an order of magnitude or more. In this presentation, we begin by reviewing the rationale for using relative density as a primary monitoring index, rather than absolute density or population size. Then, by referencing lessons from wildlife monitoring science, findings from population simulation models, and analysis of multiple street dog survey programs around the world, we review the potential pitfalls of population size estimation and suggest best practices for generating more reliable and consistent estimates when they are needed. We also introduce the potentially complicating role of spatial survey geometry on dog detectability and the area of effective survey coverage. Finally, because obtaining acceptably accurate estimates from a field survey effort can be relatively labor-intensive, we also consider the potential of proxy variables (most notably human population density at different spatial scales) as indicators of street dog population size. Because the human system drives street dog population dynamics to a significant extent, developing a better quantitative understanding of this relationship is critical.

Abundance of pet dogs in Rawalpindi district of Pakistan

S.I. Shah, M. A. Beg, M. S. Nadeem, A. R. Kayani and N. Rashid

This study provides information on the occurrence of pet dog in a city, towns and villages of Rawalpindi district, which is located very close to Islamabad, the federal capital of Pakistan. A guestionnaire survey of 1860 households was carried out from May, 2010 to December, 2012 in four areas of Rawalpindi city, in three towns and in 16 villages of Rawalpindi district and all areas were selected randomly. The questionnaire was in local language and filled in during a personal interview with the household head or adult person to gather information on pet dogs (e.g. the owner's name, number of people per household, number of dogs per household etc.).

A total of 1860 households, populated with 13641 people were surveyed for pet dogs. Only 709 (38.12%) households were positive for pet dogs 25 of these households belonged to city, 97 to towns and 587 to villages. In the 709 households, a total of 969 pet dogs were recorded. The overall dog to human ratio was 1:14, while for the city it was 1:60, 1:13 for the towns and 1:12 for the villages. Of a total of 754 dogs, 19 were chosen at birth, 466 were adopted when 1-3 months old, 91 at 4-6 months age, 124 at 7-12 months age, and 54 were adopted when they were 13-25 months old. The number of pet dogs per household varied from 1-6; there being 542 households with 1 dog, 125 with 2 dogs, 15 with 3 dogs, 11 households carried 4 dogs each and 5-6 dogs lived in the remaining 16 households. Only six of the 1796 people interviewed confessed that they did not wash their hands after handling their dog (s), while the remaining 1790 people told that they did wash their hands but for different reasons. About 182 people cleaned their hands for only religious reasons, 320 people did so for only hygienic reasons, and 1294 people told that they washed their hands both for religious and hygienic reasons. This study gives information about the size of indoor segment of the dog population in Pakistan. The pet dogs are very near to humans and physically not for away from the owned roaming dog and stray dog complex. This proximity is important from rabies epidemic point of view.

Free-roaming domestic dog demography in rural villages near Serengeti National Park, Tanzania

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Free-roaming domestic dogs, Canis familiaris, are a public health and conservation concern in Tanzania because they are a reservoir for rabies. In the villages immediately bordering Serengeti National Park, domestic dogs have been vaccinated annually for rabies, canine distemper, and parvovirus since 2003. As a result, rabies incidence has declined in human, dog, and wildlife populations. However, the full impact of the vaccination program on domestic dog population dynamics remains unclear.

In 2010, we initiated a four-year longitudinal study to determine the effects of the dog vaccination campaign on domestic dog population dynamics by characterizing and comparing dog demography, welfare, and ownership practices in villages within the current vaccination zone (n=2) and outside the vaccination zone (n=2). We collected demographic data by following the life histories of individually marked and photographed dogs, assessed welfare through body condition scores, collected ownership practice data with questionnaires for households owning study dogs, and conducted an annual village census to assess dog abundance. Preliminary results of data collected 2010-2013 revealed differences in dog survival between individual villages, but no clear differences in survival between vaccination and nonvaccination zones. Puppies (<12 months old) had lower survival rates than adults. Adult male dogs had higher survival than females. Body condition scores of adult dogs strongly anticipated survival into the following year, with higher body condition scores resulting in decreased risk of death. Primary causes of death included sickness and hyena predation.

Our data suggest factors other than vaccination, such as ownership practices, may influence dog population dynamics. Understanding dog population ecology in the context of the Serengeti ecosystem will provide vital information for implementing rabies vaccination programs in Tanzania and other areas where domestic dogs are a public health and conservation concern.

Community regulation of the ecology of four owned, free-roaming dog populations

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It is often assumed that where domestic dogs are free to roam there are "too many" and that they are either un-owned or owned but neglected by their owners. The resulting presumption is that reducing the number of free-roaming dogs would resolve associated problems such as human health and animal welfare concerns. Subsequently, such assumptions necessitate "population-level" interventions, such as culling, removal or sterilisation programs, which may occur as isolated activities or regardless of context.

With permission of the author, we present the published results of a three year observational study of four entire free-roaming dog populations which suggest stable populations of owned dogs in these cases (Morters 2014 a,b). Two of the populations were located in Gauteng Province, South Africa, and two in Bali Province, Indonesia. There were no dog population management interventions by local authorities or animal welfare organisations in any of these populations during the course of this study. Contrary to previous reports, almost all (>99%) of the dogs were owned and cared for by their owners, with most dogs being in acceptable or good body condition. Survey data were confirmed through Participatory Rural Appraisal methods, to confirm the majority-owned status of the communities' dogs. Rates of ownership were consistently low, with approximately 10% of households owning an average of c. 1.5 dogs across all sites. Either no population growth or a progressive decline in population size were observed during the study period, with community members choosing for themselves the number of dogs they wanted to own.

These studies have far-reaching implications for the health and welfare concerns associated with free-roaming dog populations, including that they may not be resolved through a reduction in the number of roaming dogs. Rather than focusing on population-level management, activities to address animal welfare and community concerns should seek to understand specific conflicts and concerns within the community and address these on a case-by-case basis as appropriate. We will elaborate on how this theory is put into practice in two site-specific projects in South Africa and Bali.

Comprehensive holistic approach to Dog Population Management in Asia Pacific

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Millions of dogs are killed around the world annually, many of which are either ownerless or owned but allowed to roam free.

In 2011, World Animal Protection identified the fear of rabies as a main driver for culling of dogs and launched its global 'Red Collar' campaign, promoting mass dog vaccination instead of culling to control and eliminate canine rabies. We have built a very sound platform with key governments where dogs are culled for rabies in Asia, as well as with inter-governmental organisations (e.g. ASEAN and SAARC) and other relevant organisations. World Animal Protection has played a key role with governments, United Nations agencies and other NGOs in developing regional strategies, country specific national strategies and national action plans to eliminate rabies.

World Animal Protection is now planning to launch a new global campaign, focussing on dog population management, from 2015 onwards. This campaign's main objective is to work directly with relevant governments, competent authorities and targeted individuals worldwide and convince them to implement the full ICAM dog population management cycle to manage canine overpopulation and improve responsible ownership methods and to create an environment in which dogs and humans can co-exist harmoniously. Regional and national rabies elimination strategies developed in Asia already recognize the importance of dog population management as a key component of rabies control - for example ASEAN's Rabies Elimination Strategy and Bangladesh's national action for rabies eradication have given very high importance to dog population management.

World Animal Protection's experience of working with governments to eradicate rabies, from national action plan development to capacity development to delivering vaccines to dogs at field level, will provide an effective platform for our new campaign on dog population management. We recognize the importance of multi sectoral collaboration, especially within individual countries, where inter-ministerial collaboration is vital to run an effective program of this type.

Multi-sectoral collaboration, governments' commitment to humane and effective rabies control under the Red Collar campaign and the recognition of dog population management within national policies will provide a great platform for working together effectively on humane dog population management. Furthermore science-based knowledge on dog ecology and ownership status gathered during the Red Collar campaign will be vital for this new campaign. We believe the environment built for rabies eradication by our Red Collar campaign will serve as a very desirable platform for dog population management in countries and in the region.

Monitoring DPM programmes

Decreasing the relinquishment of owned dogs by implementing behavior modification therapy

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Today, numerous studies have found that behavioral problems, including aggression toward people or nonhuman animals, were the most frequently given reasons for relinquishment of owned dogs. The magnitude of this problem illuminates the need for further understanding of behavioral problems as they associate with relinquishment, which is the most common reason for growing stray dog population. Responsible ownership is the key component for decreasing stray dog population, and that includes finding professional help for pet behavioral problems. Implementing this kind of mental health care, we can reduce conflict between owner and a dogs, as well as increase chances of a better life together. The data set consisted of information from 50 canine records where the owner reported a behavior problem. In order to diagnose a behavior problem we must first rule out all the medical causes that might contribute to the problem behavior. In 50 cases, 3 were medical (ear infection, urinary incontinency, blindness). The rest of 47 cases were behavioral, where the owners reported that they are ready to relinquish the dog if the problem can't be "fixed". Most common behavioral disorders were- aggression towards people, fear of various things, destructiveness in the house, aggression towards animals, biting, excessive vocalization, problems between new pet and other pets, leash aggression, general disobedience. After preliminary consultations where the detailed plan for behavior modification was presented to the owners. 15 out of 47 decided not to go ahead with the treatment stated that the reasons were -1. money, 2. unable to find time, 3. "not believing" in treatment. In 32 cases behavior modification therapy was conducted. In 7 cases the problem behavior persisted, but with the lower intensity and frequency, which for the owners was "good enough" as they stated, and they no longer considered the relinquishment. The reason for this outcome was lack of owners will and persistence.

In 25 cases, the treatment was fully completed, all with the positive outcome, where the owners stuck to the program, and as a result dogs did no longer exhibit problem behavior, therefore, the relinquishment was no longer an option. In conclusion, it is indicative that the owners changed their minds for abandoning their pets as soon as they had a professional to talk to, and give them some advice and explanation of the problem. It is safe to say that animal behavior problems often have detrimental effects on the relationships between pets and their owners and, consequently, function as important determinants in relinquishment decisions. Therefore, an intervention strategy for educating owners and training dogs from the first day in their new home, may contribute to the reduction of relinquishment, as well as finding a professional help for even the smallest change of behavior in pets.

Tracking dog movements and the implications of rabies vaccination strategies

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Although rabies can be transmitted by a wide range of mammals, different variants are usually responsible for the disease cycles in these hosts. There are two independent variants that are found in South Africa, (von Teichman et al. 1995) the Canidae variant (i.e. domestic dog), and the Herpestidae variant (i.e. mongoose). While other mammals such as humans and livestock are victim species and may become infected, they are dead-end hosts and do not contribute to the maintenance of the disease. In KwaZulu-Natal the rabies virus circulates in the domestic dog which is also the primary vector involved in rabies related human deaths. To eliminate Rabies in KwaZulu-Natal, it was felt that information on the primary vector would be critical to the success of the project. The following questions were asked:

When is the best time of day to vaccinate dogs against rabies? If having unrestricted freedom, how far would dogs move away from their households? What is the optimal area to ring vaccinate around a case of rabies in order to halt the spread of the disease?

This study was undertaken to try and establish the movement of free living village dogs (owned but not permanently controlled). This included type of activity, time of movement, distance covered and included male and female dogs, both entire and sterilized. We placed GPS plus collars on individual dogs for a period of no more than 14 days, taking a reading every 3 minutes. The tracked dogs showed a tendency to remain close to the household that was feeding them even though some of the dogs were only fed every two days. The dogs that were not provided with food and water moved just far enough away to get water.

On average across all test subjects the dogs would move up to 473m from their respective households and travel up 22.6km in total over the test period. The exception was an intact male who moved 1.83km on several occasions and travelled 72.3km in the 14 days.

In conclusion these dogs' activity levels generally dovetailed with human activity. Thus visiting households while people are around is the preferred time to vaccinate. The dogs' didn't move excessive distances away from their households so a ring vaccination, relatively close to the epicentre of an outbreak could control an outbreak of Rabies. This excludes the potential of a rabid dogs' uncontrolled behaviour changes contradicting our findings

Recommendations for using behavioural indicators to assess animal welfare impact of dog population management interventions.

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Humane, effective and sustainable dog population management remains a permanent challenge for many countries around the world. Despite the scale of the task, and the numerous groups, organisations and authorities involved, there are no agreed set of measures to establish whether intervention is successful. Furthermore, there is a paucity of scientific data to provide objective evidence to assess progress and guide future work. Improving dog welfare is one of eight of the most common impacts often targeted by dog population management interventions. The welfare of dogs (in a target population) may be considered in terms of attempts to cope with their environment. Indeed, failure to cope with environmental challenges may lead to reduced welfare, which manifest in alterations in a suite of biological indicators which can be objectively measured. Here we argue that changes in dog behaviour over time with planned interventions may provide evidence of animal welfare impact. Behavioural indicators, have an advantage over some biological variables in that they can be measured using non-invasive methods, and can be recorded unobtrusively. Importantly, behaviour is considered the ultimate expression of changes in the animal's internal environment (e.g. physiological and decisionmaking processes), and it is often described as the ultimate phenotype (interaction of genotype with environment). Behavioural measures are widely used to assess welfare across a range of species, and in dogs they are typically used to assess how they are faring in captive environments (e.g. kennels, shelters, and laboratories); rarely has behaviour been used to assess welfare of dogs in free-roaming populations. Nonetheless, the same basic principles apply and here we review the literature to identify behavioural indicators in free-roaming dogs that can be used to identify changes in welfare, broadly speaking they fall into the following categories: (a) conspecific (dog-dog) interaction; (b) dog-human interaction; (c) changes in activity budgets; (d) behavioural responses to challenge, and (e) the presence/ absence of particular behaviours. However, the validity of these indicators are not well established in the field and this remains the main limitation of the review, hence we strongly encourage further field testing of these putative behavioural indicators through collaboration between academics and practitioners. In addition, we make further recommendations on recording methods for field staff so that behavioural indicators can be more widely included in animal welfare impact assessment for dog population management interventions.

Towards a scientific-based assessment of dogs' welfare in shelters

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The risks for dogs' health and welfare when housed in shelter environment, especially for long periods of time, are now well recognised. However, assessment tools often rely on measures being indirect, costly (e.g. cortisol levels), or time consuming (e.g. experimental observations). The need for an easy-to-implement and reliable tool allowing the direct assessment of dog welfare in shelters is of outmost importance. The 'Shelter Quality' protocol is a new tool developed to assess with scientific rigour shelter dogs' welfare. This protocol focuses on the collection of animal-based measures in order to estimate the actual welfare state of the animals in terms of their behaviour, health and physical conditions. Relevant environmental and animal management features were also included to allow a risk assessment to identify key hazards for poor welfare. Inter-observer agreement, reliability of the protocol and repeatability of the measures were methodically assessed. A total of 29 shelters (n=1308) in Italy, Spain, Croatia, Romania, Serbia and Montenegro were evaluated. Average assessment time per shelter was 172 min. Over 30% of pens did not offer an adequate amount of space. Overall, 31% (n = 242) of pens were recorded to have inadequate resting areas. Health-related issues (e.g. lameness, cough, poor BCS) were recorded with a low frequency (less than 10% of total observations). Logistic regression analysis showed a higher incidence of dirty or wet coats associated to inadequate bedding or space allowance (p=0.01 and p=0.0003, respectively). Inadequate bedding, space and the presence of sharp or harmful edges in the pen were also linked with clinical conditions, i.e. injuries to the body, hair loss and swelling (all p=0.003). Further, body condition varied with space allowance i.e. inadequate space was associated with low body condition (p=0.0001) and with feeding regime (p=0.02). The 'Shelter Quality' protocol was proven to be a suitable and practical tool to identify shelter design features and management procedures that were predictive of poor welfare and that required remediation. A systematic collection, in a standardised manner, of animal-based measures would help creating a large dataset essential to move towards reliable quantitative risk assessment of shelter dogs' welfare.

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Government collaboration

Development of a robust canine welfare assessment for dogs in trap-neuter-return programmes

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There is much debate regarding the most effective, practical and humane approaches to dog population management (FERA et al., 2011). A variety of techniques may be utilised in dog population management including both medical and surgical sterilisation. Surgical sterilisation is often delivered through Trap-Neuter-Return (TNR), Catch-Neuter-Vaccinate-Return (CNVR) or Animal Birth Control (ABC) programmes. For simplicity this abstract will utilise the acronym TNR when referring to the capture of free-roaming dogs for the purposes of surgical sterilisation, though the terms ABC or CNVR may also be applied to some programmes, and specific capture and vaccination techniques may vary between programmes.

TNR is considered by animal welfare charities, academics and the OIE, to be an essential tool in the control of dog populations, zoonoses and human-dog conflicts (FERA et al., 2011, OIE, 2008). The ubiquitous nature of TNR, its application by leading animal welfare organisations, and the poor welfare implications of alternative dog population control measures, all contribute to the perception of TNR as a positive welfare intervention. However, concerns have arisen with regard to the potential for welfare problems and the lack of a robust, evidence-based, dog welfare assessment methodology for use in these programmes (FERA et al., 2011).

However the variety of techniques used in TNR projects, combined with the focus on population control, may result in the compromise of individual dog welfare within the programme. At present there are no existing protocols for measuring welfare of individual dogs within the TNR process, and thus identification of welfare problems, and monitoring of welfare improvements is challenging.

This project has reviewed existing scientific literature, and harnessed the experiences of staff in TNR programmes to develop a preliminary composite canine welfare assessment protocol comprising both behavioural and resource-based measures. This pilot welfare assessment protocol, has been trialled and refined at existing TNR programmes. This robust and practical dog welfare assessment will allow individual dog welfare to be objectively evaluated throughout the TNR process, identifying key stages where dog welfare may be compromised and thus allowing remedial action to be taken in order to safeguard individual dog welfare.

A robust and widely applicable dog welfare assessment will allow individual dog welfare to be objectively measured throughout the TNR process. Identification of key welfare problems also allows for remedial action to be taken in order to safeguard dog welfare.

FERA, WSPA, RSPCA IFAW, HSI, OIE & WHO. 1st International Conference on Dog Population Management. 2011. OIE. Putting the OIE Standards to Work 2nd OIF Global Conference on Animal Welfare 2008.

A review of published studies on dog population management with respect to comprehensive approaches and outcome monitoring Eckman, H.*, IFAW, 290 Summer Street, Yarmouth Port, MA, 02675, heckman@ifaw.org

In 2007, ICAM published its first dog population management guidance, advocating a comprehensive approach to addressing dog population management (DPM). Historically, projects in the field have primarily focussed on one or two: shelters were once the focal intervention type, but in recently sterilisation and vaccination have formed the backbone of many dog population management projects. Other elements, such as community and stakeholder engagement, education or public awareness campaigns are often significantly less intensive, or entirely excluded from interventions.

Additionally, many projects that have attempted to fully incorporate multiple elements of a comprehensive approach have not had rigorous reporting, monitoring and evaluation and therefore the success or failure of any particular aspect of a project is difficult to determine.

We undertook a review process to establish the type of data currently available in the dog population management field regarding project outcome data, with a focus on those projects demonstrating a "comprehensive approach" to DPM.

3,739 papers, reports and articles were identified that bore relation to stray animals. These went through several stages of filtering to identify those that made reference to elements of a comprehensive approach. In total, 302 papers were identified for critical appraisal in relation to a comprehensive approach to DPM. Additionally, expert referral was used to identify projects thought to be undertaking a comprehensive approach but which had not produced published materials. 21 projects were recommended through expert referral.

While it initially appeared that a large amount of data was available for analysis, it became apparent that there is very little information available about the successes or failures of fully comprehensive approaches in DPM. Published data falls largely into four categories: Rabies and other zoonotic diseases, surveying methods and results, comparative academic studies, and examination of individual elements of DPM, with Brazil and India as the countries where the largest amount of data is currently being published. Few projects have thoroughly documented the success of failure of their approach or specific elements with respect to human or animal outcomes. The primary exception is with regard to projects whose objective is primarily rabies control.

We conclude that the dog population management field has yet to fully take up guidelines recommending comprehensive approaches. Moreover, there is significant progress to be made with regard to the availability of consistent outcome-level data required to more rigorously assess the success or failure of individual elements of comprehensive dog population and welfare management projects.

Characterization and reproductive control program of pet population in São Paulo. Brazil *Garcia RCM¹; Amaku M², Biondo AW¹, Ferreira F² ritadecassiamariagarcia@gmail.com

OBJECTIVE: To characterize canine and feline populations and to evaluate the impact of a canine and feline surgical reproductive control program in an area of São Paulo city, Brazil.

METHODS: Three cross-sectional census surveys and a reproductive control program were performed in a São Paulo area with 4,275 households. Interviews with structured forms based on international guidelines were carried out by the community basic health workers along with hired interviewers. The two first surveys were performed in 2005 and 2006, prior to reproductive control and used to characterize the canine and feline populations and demography. The third survey was performed in 2008, eighteen months after the reproductive control program had been established.

RESULTS: Between 2144 - 3190 dogs and 360 - 1077 cats were registered in each census; 65% of the dogs were younger than 3 and 74% of the cats were younger than 1 year of age. The canine and feline populations had a high mortality rate for juveniles younger than one year of age. The mean life expectancy at birth was 3.9 years for male and 5.9 years for female dogs, with a mean age of 3.36 years. A turnover of 42% and 64% was observed for canine and feline populations respectively with a mean age of 1.66 years, the feline population is younger than the canine population. The male: female ratio in the population was 1.4:1 for dogs and 0.8:1 for cats. From 2005 to 2008, there was an increase in the number of spayed or neutered animals: 12% for male dogs, 21% for female dogs, 14% for male cats, and 22% for female cats. After the reproductive control program had been implemented, there was an 8% and 18% decrease in canine and feline birth rates, respectively.

CONCLUSIONS: Canine and feline populations were young and characterized by high birth and high mortality rates for juveniles under one year of age. Mean age of cats was low. The reproductive control intervention decreased effectively the canine and feline birth rates.

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Human and animal health collaboration in Rabies control in the Philippines

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Rabies is still considered a public health concern in the Philippines with more than 500,000 individuals exposed to the disease and less 200 suspected rabies deaths in 2013.

The Collaborative effort between the Departments of Health and Agriculture to control and Eliminate rabies started in the late 1980s. This was formalized in 1991 with the Signing of the Memorandum of Agreement among the Secretaries of Health, Agriculture, Education and Interior and Local Government.

In 2007, Republic Act 9482 or the Anti- Rabies Act of 2007 was signed into law mandating the creation of a National Rabies Prevention and Control Program (NRPCP) to be implemented by the Departments of Health(DOH), Agriculture (DA), Interior and Local Government (DILG) and Education (DepEd), as well as Local Government Units (LGUs) with the assistance of the Department of Environment and Natural Resources (DENR), Non-Governmental Organisations (NGOs) and People's Organisations (POs). The goal is to eliminate rabies in the country and declare the Philippines as a rabies free zone by 2020

In 2009, the Department of Health adopted a different approach to eliminate human rabies when the Philippines was selected as one of the 3 demonstration sites of the WHO-BM Gates Foundation rabies elimination project. The goal of this project is to prevent human rabies through the control and eventual elimination of canine rabies, creating a paradigm shift for human rabies prevention in Africa and Asia. The project focused on dog vaccination, was implemented in collaboration with the DA- Bureau of Animal Industry.

With the initial success of the project, showing that that human rabies can be eliminated by controlling the disease at the source, rabies was included among the priority disease of the Department of Health's KP (Kalusugan Pangkalahatan or Universal Health Care) roadmap for 2014-2016.

The collaboration between the two Departments was further strengthened in May 2014 when Health Secretary Ona and Agricultural Secretary Alcala signed a Memorandum of Agreement (MOA) to jointly eliminate rabies in the country. This paved the way for the transfer of funds from DOH to DA for the procurement of animal anti- rabies vaccine to augment DA's limited supply of animal anti-rabies vaccine to ensure that adequate vaccines are available to vaccinate at least 70% of the estimated total dog population in the country and hopefully contribute to the achievement of the objectives of the DOH KP Roadmap for rabies

Mass Dog Vaccination (MDV) and One Health Implementation for Rabies Control in Bangladesh

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Rabies remains as a major public health problem in Bangladesh. The disease exists worldwide except few countries. Africa and Asia bears the major burden of rabies though it is prevalent in South America also. It is believed that about 70000 peoples die worldwide every year from Rabies. In the Asia continent, South Asia is the hot seat with India being number one country in the world with as high as 20,000 cases annually. In Bangladesh, rabies related yearly mortality is >2000 most (88%) of which are from rural areas and majority of the victims are children (49%) under 15 years old. In 99% cases, the disease is transmitted by dog. In Bangladesh, there are about 1.2 million dogs of which 83% are stray. Achieving herd immunity through mass dog vaccination (MDV) is believed to be the preferred method for rabies elimination. Along with other three strategic approaches, MDV has been adopted as the most important component for elimination of rabies in Bangladesh by 2020. The country piloted MDV in Cox's Bazaar Municipality area in 2011. Then it scaled up MDV in 63 of 64 district municipalities vaccinating about 100 thousands dogs with 85% coverage. Three rounds of MDV campaign have been completed in two district municipalities. The country has to conduct three rounds of MDV in all the areas of its territory within 2016. In Bangladesh, rabies elimination campaigned has become a good example of One Health approach with multisectoral involvement. Communicable Disease Control Unit of Directorate General of Health Services has been orchestrating the rabies elimination activities with assistance of Local Government and Fisheries and Livestock ministries and international organisations and development partners. Bangladesh started modern dog bite management (DBM) in 2010 in one centre in capital city Dhaka and by the year 2012 the country has established 64 DBM centers throughout the country with trained physicians, nurses and free vaccines. Reduction of rabies cases of about 50% has been noticed in the country. If the same trend continues, the country can really dream to achieve the target of 90% reduction of rabies cases by 2015. So by combining DBM, MDV, dog population management (DPM) and advocacy, communication and social mobilization Bangladesh is targeting to celebrate its 50 years (2021) anniversary of independence as a rabies free country.

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Implementing Rabies control strategy in a devolved government, adoption of One Health Approach

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Background

Kenya's strategy for eliminating rabies is simple: vaccinate at least 70 % of the dog population annually- for at least three Consecutive years, and the disease will be eliminated not only in dogs, but also in humans and wildlife. It is an attractive concept to controlling infectious diseases; control the disease at the animal level (in this case the domestic dog) and free humans from the scourge. Kenya launched her "Strategy for the Elimination of Human Rabies By 2030", effectively making her the first African country to embark on a journey to realizing vision of ridding the world of the deadly rabies disease.

The traditional approach has always involved disjointed vaccination strategies closely preceded by baiting campaigns especially in urban areas like Nairobi County. This approach has however received heavy criticism from animal rights/welfare campaigners as being cruel and unsustainable.

By conducting mass dog vaccination targeting greater than 70% of dog population coverage annually for three consecutive years. Kenya has committed to implement dog population management strategy comprising education, legislation, registration, sterilization, holding facilities, euthanasia and controlling access to garbage and left overs. The country aims to implement this from a national perspective as well as from a devolved approach.

Traditional approach involved culling(Baiting of dogs) using strychnine by the subcounty veterinary officers, neutering, public awareness and vaccination against a disease believed to be harbored largely by domestic dogs (between 2002 and 2012, domestic dogs accounted for 45% of the 858 confirmed rabies cases in Kenya).

In Kenya, the profile of zoonotic diseases has risen following implementation the WHO International Health Regulations 2005 (IHR) and more so after the establishment of a National One Health office (referred to as Zoonotic Disease Unit). Rabies is among the top five priority zoonotic diseases in Kenya.

This rabies elimination strategy will guide systematic reduction of the disease risk through sustained mass dog vaccinations, pre and post-exposure prophylaxis in humans and public education. This strategy is based on activities planned in accordance with the Stepwise Approach to Rabies Elimination (SARE) for the country to move from an endemic state to a disease free status.

OIE initiatives to improve stray dog population control, an example from Europe

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Since May 2005, the World Assembly of OIE Delegates (representing 180 OIE Member Countries) has adopted ten animal welfare standards for terrestrial and four for aquatic animals. The OIE standard on stray dog population control was adopted by the World Assembly of Delegates in May 2010. OIE member countries from Europe (53 member countries) identified stray dog population control as one of the three priority topics of the OIE Platform on Animal Welfare for Europe, together with slaughter for human consumption and transport of animals by land. The OIE Platform was launched in December 2013 and its first Action Plan covering 2014-2016 adopted at the same time. The Ultimate objective of the Action Plan is to improve the animal welfare in the whole Europe region, by empowering Veterinary Services from Europe to take actions to implement OIE standards on animal welfare. To date, the European Commission is the main financial donor of this Action Plan, but France, Germany and country hosts of events also contributed to the budget of the OIE Platform. As part of this Action Plan, the following activities dealing with stray dog population control have been or will be conducted: (i) the first workshop on stray dog population control for Balkan countries in Bucharest, Romania (SDB1 - 17-19 June 2014), (ii) a regional workshop for OIE National Focal Points from Europe on communication in Tallinn, Estonia (1-3 July 2014), (iii) a regional workshop for National Focal Points on Animal Welfare from Europe (2015), and (iv) an awareness campaigns on stray dogs for Eastern Europe countries. The first workshop on stray dog population control (SDB1) was very successful; the Balkan countries notably agreed on a shared vision on sub-regional level "to become compliant with OIE standard on stray dog population control by 2025, thereby implying that the stray dog population is reduced to an acceptable level and the risk of transmission of rabies and other zoonoses to human through stray dogs is mitigated". Countries also gained a deep understanding on the stray dog Self-Assessment and Monitoring tool developed by the OIE and its Collaborating Centre in Teramo, Italy. The tool will be used to set up the baseline situation and monitor the progress of compliance with the OIE standard on stray dog population control on regular basis. Results of this Self-Assessment and Monitoring tool will be soon available, but it is already known from the country presentations made during the SDB1 workshop that 60% of the Balkan countries experienced increasing trends in stray dog population over the past years and most of them identified the irresponsible dog ownership as a major challenge to address in priority. Other priorities include the estimation of national stray dog population and the review of the national legal framework on stray dogs. The Balkan countries supported the idea to develop national stray dog roadmaps to achieve the agreed vision at subregional level, and to participate in regular regional Follow-up Workshops to measure progress. The second workshop on stray dog population control (SDB2) is scheduled in June 2016. The OIE Platform will also stimulate sub-regional dialogue on stray dogs, organise and coordinate capacity building activities and collect and post best practices and other materials and post on its website.

A similar Workshop will be conducted in 2015 for Caucasus and Central Asian countries.

Detailed information about the stray dog activities (and others) of OIE Platform on animal welfare for Europe is available at: http://rpawe.oie.int/

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Make your mark: expanding identification options for roaming dogs

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This presentation will introduce the challenge of identifying roaming dogs who are non-surgically sterilized/contracepted and/or vaccinated against rabies. It will then discuss an Alliance for Contraception in Cats & Dogs (ACC&D) initiative to develop a visible marker that identifies treatment type and timeframe for roaming dogs.

Non-surgical fertility control (NSFC) for roaming dogs will enhance both animal and community well-being. In order for NSFC to offer optimal value, however, we must know that an animal has been treated. Current NSFC options do not require general anesthesia, making them ideal for field use but precluding the ear notch commonly used to identify sterilized dogs. Furthermore, non-surgical options may be permanent (e.g., Zeuterin[™]) or temporary (e.g., Suprelorin[®]). Consequently, it is important that a mark have capacity to convey information such as what NSFC was used and if/when an animal will require re-treatment.

Particularly for roaming dogs, a new marking method could also strengthen rabies prevention programs by permitting effective, extended monitoring of vaccinated dogs. This would make vaccination efforts more cost- and resource-effective, as those conducting campaigns could know which animals were recently vaccinated and target those needing a first or booster vaccine.

Recognizing a challenge and opportunity, ACC&D spearheaded an initiative to develop a humane, affordable, effective method to 1) identify NSFC-treated animals, and 2) communicate the timeframe of contraceptive treatment and/or rabies vaccination. The initiative's multidisciplinary nature is noteworthy. It has convened experts in veterinary medicine, including pain management; animal behavior; fiber science; electrical engineering and RFID technology; animal sciences; and wildlife biology, among others.

The project launched with a review of methods currently used to mark and identify companion animals, wildlife, farm animals, and even marine mammals. This was followed by an InnoCentive Brainstorm Challenge to crowdsource ideas from around the globe, and then an ACC&D Scientific Think Tank. During the latter, the team determined that ear tags have not been optimized in terms of design, materials, humane application, safety, or comfort.

The initiative has now advanced to a partnership with Cornell University and its faculty of veterinary medicine, fiber science, and electrical engineering. We anticipate a prototype ear tag at the conclusion of the 2014-15 academic year. We will then advance to trialing and design refinement, during which there may be international collaboration opportunities for both field trials and surveys among residents of communities where a tag could enhance both dog population management and rabies prevention efforts.

Ending Inhumane Culling of Dogs around the World

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Large free-roaming dog populations are considered a threat to the public in many countries and are sometimes dealt with by inhumane culling. World Animal Protection is launching a new campaign, bringing together governments, communities and NGOs, in all four corners of the world, to support and implement sustainable and humane dog population management as an alternative to needless culling.

World Animal Protection has worked to protect dogs for decades, including campaigns targeting rabies. Our new campaign builds upon this history, promoting a holistic cycle of dog population management methodology in order for dogs and humans to coexist harmoniously.

Africa: Kenya

The Government of Kenya has made significant efforts to change the way they deal with rabies and their dog population. World Animal Protection has provided assistance to the Zoonotic Disease Unit in the development of their strategy to eliminate rabies by 2030. Five pilot areas for mass dog vaccination have been identified, one of which will be led by World Animal Protection.

Asia Pacific: China

World Animal Protection is collaborating with the China Animal Disease Control Centre (CADC) and has facilitated the development of humane and sustainable ways towards the elimination of rabies in the country through the implementation of mass dog vaccination and education programmes.

Europe: Romania

World Animal Protection is promoting collaboration between the government and local NGOs for the implementation of sustainable, long-term solutions to the dog population problem in Romania. We are assisting the government in the development of a national DPM action plan and have sponsored a mobile neutering and education clinic run by the local NGO Save the Dogs.

Latin America: Mexico

World Animal Protection worked for almost six years in the state of Puebla, Mexico supporting them in the implementation of rabies vaccination and spay-and-neuter programmes. Puebla is now canine rabies free and the state vets are fully trained to carry out spay and neuter campaigns.

A System for the monitoring and evaluation of community animal welfare projects: Lessons learned

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Wise Monkey, in support of the International Fund for Animal Welfare, has been developing and piloting a prototype system for monitoring community and animal welfare. This is both a technical and non-technical solution whereby templated tools may be locally customized and configured to support local environments. These tools have been under development and tested in 3 projects in Bali, Mexico and Northern Canada. Each project has presented a different set of challenges and provided insights into appropriate tool selection for data collection, sample selection, and integration with ongoing work.

Because projects are often established in the most challenging environments using limited staff who are often untrained in data collection, DPM project monitoring differs significantly from academic studies where appropriate strategies, sites and staff are selected up front. Attempts to devise a flexible monitoring system which still delivers high-quality results has therefore resulted in a variety of challenges.

Each project addresses a defined community population, but each approaches community members and/or dogs on different timescales and levels of predictability. While some projects may have planned interactions at regular intervals, others rely on reactive approaches, making it difficult to select an appropriate across-theboard sampling strategy for monitoring community progress. Further, being in the early phases of project development has significantly impacted two projects, where planned activities were supplanted by more urgent activities a significant proportion of the time, and where spontaneous legal issues presented obstacles to effective data collection strategies. Lastly, while the technology allowed far greater feedback between project managers and staff than ever before, lack of local buy-in or support for the technology inhibited its appropriate or most effective use in one case.

Presented here are our findings to date, key challenges in implementation and our future plans in this ongoing project.

A model for dog population management in Southeast Asia

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Thailand may be world renowned for its beaches and Buddhist temples, but few are aware of the magnitude of animal welfare issues that plague the country. Founded in 2003, Soi Dog Foundation is a charitable organization committed to ending the suffering of stray cats and dogs of Asia. Since its inception, Soi Dog has transitioned from a grassroots effort to one of the most successful dog population management programs in the world. Soi Dog operates a large animal shelter with over 400 animals, international adoption program, robust field sterilization program, and highly effective fundraising campaign rooted in Facebook. Soi Dog is also the leading agency combating the cruel and illegal dog meat trade in the region.

Soi Dog Foundation serves as a model for Southeast Asia on how to humanely reduce the number of unwanted animals through sterilization. To that end, Soi Dog has spayed and neutered over 70,000 cats and dogs in the face of extremely limited resources. Hurdles along the way have included governmental resistance, limited drug availability, cultural issues, and the high prevalence of infectious diseases.

Asia's dog meat trade is one of the largest animal welfare concerns in the world but Soi Dog's efforts have largely stopped this international trade. The keystone of the program has been undercover agents in border areas who inform law enforcement agencies about dog traffickers. Soi Dog educates the police and other agencies about the laws pertaining to the dog meat trade, aids in sheltering and caring for over 2000 dogs that have been seized.

Soi Dog's work would not be possible without its successful fundraising campaign conducted primarily through social media. Through paid advertising on Facebook combined with a emotive style of storytelling, Soi Dog has developed a broad base of more than half a million Facebook followers worldwide. Social media is also used extensively to promote international adoptions.

Learn how Soi Dog has implemented high-quality medical standards in challenging field environments to reduce canine overpopulation, amassed a large following and fundraised using social media, adopted hundreds of cats and dogs annually to homes worldwide, and dramatically reduced Thailand's horrific dog meat trade.

The Dog Meat Trade – A substantial Risk to Humane Dog Population Management, and Rabies Control and Elimination Efforts in Asia

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The trade in dogs for human consumption is prevalent in many countries in Asia, affecting tens of millions of dogs each year. The trade, which operates in contravention to recommendations by leading human and animal health experts and existing laws, encourages the large-scale production, collection and movement of dogs of unknown disease and vaccination status. This results in the disruption of stable dog populations and a high turnover of dogs, compromising programmes seeking to reach the recommended 70% vaccination and sterilisation coverage required to control and eliminate canine rabies and stabilise dog populations.

Whilst some countries in the region have resisted tackling this trade, defending it as a cultural preference or citing it as a means of controlling dog populations, we know that the potential to spread rabies through the movement of even a small number of dogs is high. There is mounting evidence that suggests that this trade is not compatible with the ASEAN Plus 3 countries' pledge to eliminate rabies by 2020. We also know that fear, and outbreaks, of rabies are key motivations for localised dog culls, further undermining humane and sustainable dog population management programmes.

Only a few countries in Asia have eliminated canine rabies, their success owing largely to mass dog vaccination and sterilisation, and strict enforcement of legislation pertaining to strict quarantine measures and controlling the movements of dogs. However, no additional Asian countries have been able to officially eliminate rabies over the past five decades.

This presentation will provide a review of the Asia Canine Protection Alliance's work in building multi-sectoral partnerships to address the need to ensure adequate investment in the enforcement and strengthening of existing laws prohibiting the trade, with an initial focus on Vietnam. Through partnerships with the United States Centers for Disease Control and Prevention and local governments, the feasibility of rabies control and elimination is being demonstrated during the five year moratorium on the commercial trade in dogs, as agreed to at a ACPA-hosted meeting in August 2013 by the governments of Thailand, Laos, Cambodia and Vietnam.

In Vietnam, significant steps have already been taken to tackle the trade. In January 2014, Vietnam's Department of Animal Health issued a directive ordering provincial authorities to crack down on the illegal trafficking of dogs for human consumption, and to collaborate with international organisations to raise awareness about the illegality of much of the cross border trade and of dangers of consuming dog meat.

The Asia Canine Protection Alliance, in partnership with key stakeholders, will continue to prove the achievability of rabies elimination in target areas for the dog meat trade, through the implementation of mass canine vaccination, surveillance, humane dog population management and public awareness campaigns.

About the Asia Canine Protection Alliance (ACPA):

Folection Analtec (ACPA). Founded in May 2013, the Asia Canine Protection Alliance (ACPA) is an international alliance of animal protection organisations formed by Animals Asia, Change For Animals Foundation, Humane Society International, and Soi Dog Foundation. We are committed to realising the dual aims of eliminating rabies and ending the trade in- and demand fordogs for human consumption in Thailand, Laos, Cambodia and Vietnam.

List of Posters

City of gods, city of dogs: street dogs, kinship and canine co-citizenship in India

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One descriptor used to distinguish some dogs from others in much DPM literature is ownership – whether or not dogs are "owned". In this presentation, we argue that kinship, rather than ownership, is a more appropriate lens through which to perceive the relationship between humans and free-roaming dogs in India. Interviews with feeders of free-roaming dogs in Delhi, for example, support the claim that the relationship engendered through regular feeding of street dogs more closely resembles that of kinship than that of ownership in the private property sense. Although seemingly a semantic nuance, the kinship perspective allows for constructive developments in citizenship theory and dog population management (DPM) policy that are precluded by reliance on the archaic discourse of ownership.

India's DPM policy relies on an important though necessarily imperfect distinction between unowned and owned dogs or, in short, between street dogs, and private property dogs (the latter referred to as "pet dogs" in the legislation). In fact, in the light of recent legal rulings in India pertaining to the PCA Act, under which India's "Dog Rules" fall, the case can be made that street dogs have been granted de facto citizenship. Clearly, one's co-citizens cannot be "owned" in the same way that one's fellow humans can no longer be owned, and the current trajectory of rights theory also discourages such a classification.

In our presentation we will discuss recent developments in citizenship theory that extend the concept of citizenship to liminal animals such as street dogs, look at key recent legal rulings in India that have significantly altered the legal and moral landscape for animals, and assess their implications for DPM.

capm 0.6: an open source software for companion animal population management (Oswaldo Santos Baquero)

Investigation on responsible ownership in two different urban context. (Shanis Barnard)

Inter-sectoral collaboration ensures sustainability and success. (Rahul Sehgal)

Georgia - changing attitudes to street and stray animals; problems and solutions. (Miriam Chkhikvishvili)

Bringing AW and DPM concepts to areas where these concepts do not exist (Melania Gamboa)

A community involvement approach to dog population management. (M. Green)

Humane dog population and rabies management project, Colombo, Sri Lanka: a paradigm shift for the whole country. (Ganga De Silva)

Actions about Responsible Pet Ownership for a program in Chile. (Claudia Guirre)

A six years statistic of neutering cases of cats and dogs in a low cost-high volume neutering clinic in Kuala Lumpur (2008-2013). (Goh Chan Foong)

Animal Birth Control: realistic expectations, steady state solutions and monitoring. (Elly Hiby)

Intensive and skill-dependent feral dog TNR in Taiwan: A voluntary dog capture team with 7-year experience. (Kuo Hsuan)

The concept and realization of targeted dog removal: Reconciling human-dog conflicts beyond TNR in Taiwan. (Kuo Hsuan)

The importance of NGO and governmental cooperation in DPM in Nepal. (Sharma Khageshwaar B) Stray animals in Bulgaria and the experience of Four Paws. (Maria Ivanova)

New tool / system for stray dog management in Chennai and other cities in India. (Jeroldvin Shiby Joe F.M) The application of Computational Agent-Based Modelling to identify and evaluate dog population management strategies. (Maria Luz Kisiel)

A conceptual framework for multi-scale dog management to control Echinococcus multilocularis transmission in urban landscapes in North America: would it be possible? (Massolo A., S. Liccioli, A. Smith, Manderson C. & M. Rock)

Evaluation of dog population management strategies in a Southern Italian province. (Stefano Mesouri)

How do changes in shelter management affect the adoption dynamics? (T. Mikus)

Assessing the effects of a capture-neuter-vaccinaterelease program on the free-roaming dog population of Pokhara, Nepal. (Lorna Pillar)

Active surveillance of Canine Leishmaniasis in public kennels of the Emilia-Romagna Region. Italy. (Gioavanni Poglayen)

Intestinal zoonotic parasites in stray dogs from Central Italy: prevalence and zoonotic relevance. (Roberto Scarcella)

Investigating factors that influence the likelihood of dogs remaining unclaimed in local authority kennels contributing to the dog overpopulation problem in the UK. (Christina Siettou)

Coordination of activities on the study and management of dog populations in the Americas. (Marco Vigilato)

Lifestyle of canines and anothers Risks factors of Visceral Leishmaniasis in dogs in Panorama, São Paulo, State, Brazil. (Tatiana Villegas)

A no-kill approach of dog population management – the CARODOG and CAROCAT experience (Marlene Wartenberg)

New efficient methodology for rabies awareness for the population of Madagascar. (Ranaivoo Norbert Zakariveo)

Pilot study for characterization of stray dog population in Montevideo, Uruguay (S.Huertas).

Thank you to our sponsors!

All funds raised from sponsorship have been used to subsidise attendance of speakers who would otherwise not be able to attend the conference. We are very grateful to our sponsors for supporting the event in this way and ensuring that it is attended by those who will find it the most useful.



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