

Program Overview

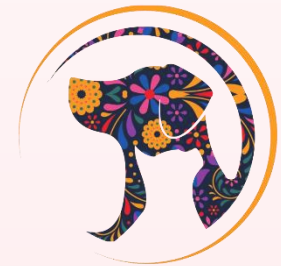
GLOBAL OUTREACH PROGRAMS FOR ANIMAL WELFARE – MÉXICO

OBJECTIVE

Global Outreach Programs for Animal Welfare - México (GOPAW – México) aims to provide accessible veterinary care to vulnerable areas of México through a comprehensive suite of services. Our objectives are as follows:

- To administer complimentary sterilization procedures for cats and dogs in underserved communities, reducing overpopulation and improving animal welfare.
- To deliver complimentary core vaccination services, safeguarding against common and preventable diseases among the local canine and feline populations.
- To implement complimentary deworming and ectoparasite control programs, mitigating the spread of parasitic infections and enhancing overall animal health while minimizing zoonotic risk.
- To offer accessible pet care education to community members, fostering understanding and compliance with veterinary recommendations, thereby positively impacting herd health and local animal welfare.
- To facilitate permanent identification (such as microchipping or ear notching) of sterilized animals, enabling effective data collection for research purposes and long-term tracking.
- To conduct comprehensive data collection on zoonotic diseases, including stool sample analysis to determine prevalence rates and identify common intestinal parasites among the studied animal population.
- To gather data on prevalent ailments such as transmissible venereal tumors, heartworm disease, and miscellaneous injuries, providing insights into pressing veterinary needs in the target regions.

The overarching goal of this data collection effort is to raise awareness of public health risks and advocate for increased grant funding to support larger-scale projects aimed at improving the health and welfare of animal populations in underserved areas of México.



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ABOUT GOPAW - MÉXICO

Central Ohio's Programs for Animal Welfare (COPAW) is a registered 501c3 organization and was founded in September 2020 with a goal of providing accessible veterinary care to animals in need with an ultimate goal of providing these same services to communities in need around the world. COPAW currently operates a low-cost spay/neuter and wellness clinic in Columbus, OH, performing 100-150 low- to no-cost surgical procedures and vaccination services each week. COPAW has since developed an additional outreach program, Global Outreach Programs for Animal Welfare (GOPAW), to provide critical veterinary care to cats and dogs around the world, beginning in Oaxaca, México.

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STATEMENT OF NEED

In México, the plight of stray animals is a crisis of staggering proportions. With an estimated 40 million dogs nationwide, an alarming 70% roam the streets, abandoned by owners or born into a life of hardship. In México City alone, nearly 20,000 stray dogs face capture and euthanasia annually, highlighting the dire consequences of inaccessible resources and the resulting neglect and overpopulation.

Compounding this issue is the harsh reality of economic disparity. Across the country, the average monthly salary ranges from 4,400 to 7,400 pesos (267-449 US dollars), leaving many families struggling to meet their basic needs. In Oaxaca, where poverty rates soar, with 24.3% of the population living in extreme poverty and 39.6% in moderate poverty, accessing veterinary care becomes a luxury beyond reach for many.

Tragically, only a small fraction of the population in Oaxaca—just 9.5%—is considered non-vulnerable, further exacerbating the challenges faced by owners, and subsequently, their pets. With the prohibitive cost of spaying, neutering, and vaccinations ranging from 1,000 to 3,500 pesos, life-saving services are simply placed out of reach for those already struggling to afford basic necessities like housing.

As rent prices soar, ranging from 4,000 to 14,000 pesos per month and steadily increase due to tourist gentrification, families are forced to make impossible choices between shelter for themselves and the well-being of their beloved pets. In this landscape of economic hardship and widespread animal suffering, urgent intervention is imperative.

Our grant proposal seeks to address this pressing need by providing accessible veterinary care to vulnerable communities in Oaxaca and beyond. Through complimentary sterilization, vaccination, and deworming services, we aim to alleviate the burden of overpopulation while promoting the health and welfare of animals and their human companions.

To provide a full-time veterinary clinic staffed by two veterinarians and three support staff, we expect the project to sterilize and treat 40-50 animals per day and to cost 191,430.22 USD annually.

IN-DEPTH ACTIVITIES SUMMARY

Global Outreach Programs for Animal Welfare – México will:

- **Provide complimentary sterilization services for cats and dogs**
- **Provide Rabies, DHPP, Leptospirosis, and FVRCP vaccinations**
 - **Rabies** is one of the oldest known infectious diseases and remains a significant global public health problem, with over 50,000 people dying from rabies annually despite aggressive vaccination efforts. The initial symptoms of rabies are typically nonspecific and may include fever, headache, and general weakness or discomfort. As the virus progresses, neurological symptoms develop, which can include insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, agitation, hypersalivation, difficulty swallowing, and hydrophobia (fear of water). Death usually occurs within days of the onset of these symptoms and the virus is always fatal once the patient is symptomatic. Unprovoked aggression is a telltale sign of rabies in animals and, because animals show aggression by biting, is one of the main methods of exposure in humans. Rabies can infect any mammal and is commonly carried by wildlife, such as skunks, squirrels, coatis, foxes, and raccoons, but is common in cats and dogs in México due to the majority of animals free-roaming and therefore coexisting with wildlife.

There are reportedly 31 species of bats known to carry seven variants of the rabies virus across México. 3,469 cases of rabies were reported in animals in México between 2010 and 2019. The true value is suspected to be quadruple the reported figure due to the wide-spread, well-known issue of chronic underreporting of the infection in domestic animals and their likelihood to wander away to die. This is especially concerning considering only 5% of reported cases were in wildlife.

- **DHPP** is a combination canine vaccination providing protection against distemper, hepatitis, parainfluenza and parvovirus. This proposal will focus on distemper and parvovirus due to the oftentimes fatal natures of the diseases.

Canine distemper is a highly contagious viral disease that affects dogs and a wide range of other animal species, including ferrets, raccoons, skunks, and wolves. Canine distemper is spread through direct contact with fresh bodily secretions such as blood, saliva, urine, or respiratory droplets from infected animals. It can also be transmitted via contaminated food and water bowls, equipment, and shared environments. The virus enters the body through the respiratory tract and spreads to the lymphatic system, rapidly proliferating and moving to other body systems. Symptoms often involve multiple body systems and can be respiratory, gastrointestinal, neurologic and systemic – including heavy ocular and nasal discharge, conjunctivitis, vomiting, diarrhea, seizures, paralysis, fever, and lethargy. Survivors oftentimes have lifetime neurological deficits after recovery.

In 2015, 70 domestic dogs were sampled at random across four cities in the state of México. Of the sampled population, 62% of domestic dogs were seropositive for CDV, and the presence of antibodies was significantly higher in free-roaming owned dogs than dogs with restricted movement. Among the wild carnivores, only the bobcat was seropositive. The rate of vaccination against CDV in dogs was low (7%), and there was a high rate of direct interactions between domestic dogs and wild carnivores.

Canine parvovirus is a highly contagious and almost always fatal virus that affects the gastrointestinal system of dogs and puppies, with a mortality rate of over 90%. Canine parvovirus is transmitted by direct dog-to-dog contact and contact with contaminated feces, environments, or people. The virus can live in the environment for months and can survive on inanimate objects such as food bowls, shoes, clothes, and floors. It is highly resistant to many common disinfectants. Parvovirus causes severe gastrointestinal distress and is categorized by severe vomiting and bloody diarrhea, fever, lethargy, anorexia, dehydration and significant secondary infection due to immune suppression caused by the virus.

At the University of Guadalajara's Veterinary Hospital, rectal swabs were taken from 146 dogs showing signs of gastrointestinal distress. Of these, 90 tested positive for canine parvovirus. The majority of the dogs affected had not been fully vaccinated, with 97.8% (88 dogs) having incomplete or no vaccination. Notably, 65% (59 dogs) were of mixed breed, and 77.8% (70 dogs) were younger than six months, with 37.8% (34 dogs) succumbing to clinical complications. Given the widespread nature of canine parvovirus in México, actual infection rates are likely much higher, exacerbated by a general hesitancy to access veterinary services and the common practice of allowing dogs to roam freely.

- **Leptospirosis** is a bacterial disease that affects both humans and animals, and is known for its potential to cause a wide range of symptoms, some of which may become life-threatening. The primary carriers of leptospirosis are wild and domestic animals, including dogs, rodents, cattle, pigs, and horses. The bacteria are shed in the urine of infected animals and can survive in water and soil for weeks to months. Humans and animals can contract the disease through direct contact with urine from infected animals or a urine-contaminated environment. This contact often happens through cuts or abrasions on the skin, or through the mucous membranes in the eyes, nose, or mouth. It can also be transmitted by drinking contaminated water. Leptospirosis can cause kidney and liver impairment and/or complete failure, vomiting, diarrhea, fever, and abdominal pain, among many other issues.

Roughly 56% of México's territory provides the ideal conditions for the survival and spread of leptospirosis, a disease identified as both a re-emerging infectious disease and a neglected zoonosis. "Neglected" zoonosis refers to a group of zoonotic diseases that are largely overlooked in public

health planning and medical research despite their significant impact on human and animal health, particularly in low-resource settings. These diseases are predominantly found in tropical and subtropical areas where they disproportionately affect poor and marginalized communities, often co-existing with poverty and resulting in a cycle of disease and socioeconomic disadvantage.

Between 2000 and 2010, a total of 1,547 confirmed cases of leptospirosis were recorded across 89 municipalities in 27 of México's 32 states. The state of Veracruz reported the highest number of these cases, accounting for 377 (24.4%), followed by Tabasco with 260 (16.8%), Sinaloa with 129 (8.3%), Hidalgo with 116 (7.5%), and Oaxaca with 97 (6.3%). The uneven distribution of cases, with nearly half reported in 2010 alone, indicates a likely increase in the disease's prevalence today. In a 2014 study, 117 dogs were randomly captured in three urban cities within the State of México for testing. Results showed that 28% of these dogs tested positive for one or more serotypes of leptospirosis. Comparative studies in México City have found seropositivity rates ranging from 22% to 76.6% in randomly sampled dogs.

- **FVRCP** is a feline combination vaccination that aims to protect the patient against feline viral rhinotracheitis, calicivirus and panleukopenia. This proposal will focus on feline calicivirus and panleukopenia.

Feline calicivirus is a highly contagious virus that is a significant cause of upper respiratory infections and oral disease in cats. This virus is one of the two major viral causes of respiratory disease in cats, the other being feline herpesvirus 1. FCV spreads primarily through direct contact with infected cats or their secretions, such as saliva, nasal discharges, and ocular exudates. The virus can also be transmitted via fomites, which are objects or materials likely to carry infection, such as food bowls, litter boxes, and human clothing or hands. Given its resilience in the environment, FCV can remain infectious on surfaces for days to weeks under suitable conditions, facilitating its spread in multi-cat environments like shelters, catteries, and households. Free-roaming cats are particularly susceptible due to their natural preference to live in colonies with other cats. Symptoms of FCP most notably include painful oral ulcers, conjunctivitis, nasal and ocular discharge, lameness, fever, lethargy, anorexia and severe systemic infections and tissue damage of the mouth, lungs, and musculoskeletal system.

Feline panleukopenia, also known as feline parvovirus, feline distemper, or feline infectious enteritis, is a highly contagious and often fatal viral disease that affects cats. It is caused by the feline parvovirus, a virus closely related to canine parvovirus. The disease is particularly severe in kittens and is characterized by rapid onset and high mortality rates. The mortality rate in kittens is over 90% and only 20-51% of cats who receive aggressive treatment and hospitalization are expected to survive. In pregnant cats, feline panleukopenia virus can cross the placenta, resulting in fetal mummification, miscarriages, or stillbirths. In some cases, if kittens are infected just before or shortly after birth, the virus may damage the cerebellar lining, leading to cerebellar hypoplasia. This condition causes underdeveloped brain structures, resulting in impaired physical coordination and tremors. During the early stages of the disease, the virus is present in high concentrations in all bodily fluids, such as saliva, tears, urine, and feces of the infected cats. Cats that recover from the virus can continue to shed the virus in their feces for up to six weeks post-recovery. Typically, free-roaming cats encounter the virus within their first year of life, making them particularly vulnerable to infection. Symptoms of panleukopenia commonly include sudden death, especially among kittens. Patients infected with the disease may also experience high fever, severe vomiting and diarrhea, anorexia, dehydration, depression and lethargy.

- **Provide Feline Leukemia testing and vaccination as additional programming, as available funding allows**
 - **Feline Leukemia (FeLV)** is a retrovirus that infects cats. FeLV can be transmitted from infected cats when the saliva or nasal secretions of an infected cat come into contact with the mouth, nose, or eyes of another cat. It can also be transmitted through social behaviors such as grooming, sharing food and water dishes, and less commonly, from bites. Kittens can contract the virus in utero or through their mother's milk. FeLV is known to cause a variety of health issues in cats, including immunosuppression – weakening of the immune system, making the cat more susceptible to other infections and diseases –

decreased red blood cells, cancer of the lymphatic system and white blood cells, weight loss, poor coat and body condition, persistent diarrhea, dehydration, painful inflammation of the gums and erosion of the teeth, and seizures and other neurological disorders. There is no cure for feline leukemia, and the lifespan of a kitten diagnosed with FeLV is only 6 – 18 months, and slightly longer for adult cats.

A study found a 76% prevalence rate of FeLV among housecats in several central Mexican states – including México State, Veracruz, Tlaxcala, Puebla, Morelos and Hidalgo - underscoring the critical need for widespread feline vaccination. Lower instances of infection have been reported with alternative testing methods, and this is likely a direct result of the lack of availability of appropriately sensitive testing methods. Because of the social nature of both the disease and feline instinct, it is imperative to implement routine testing and vaccination against feline leukemia to protect the general feline population.

- **Provide deworming and ectoparasite treatments**

In a rural community of Yucatán, southern México, a study was conducted in recent years to examine the prevalence of intestinal parasites in dogs, particularly those parasites that are zoonotically transmissible to humans. The study involved 130 dogs from 91 households. Out of the 130 dogs examined, 104 tested positive for intestinal parasites, resulting in a prevalence rate of 80%. The detected parasites included eggs from four helminth species—*Ancylostoma caninum* (zoonotic), *Trichuris vulpis*, *Toxocara canis* (zoonotic), and *Dipylidium caninum* (zoonotic)—as well as coccidian oocysts.

Intestinal parasites are commonly transmitted through the fecal-oral route, direct contact, vector-borne transmission and general environmental exposure. The fecal-oral route is the most prevalent method for transmitting many intestinal parasites, such as protozoa like *Giardia* and helminths like *Ascaris lumbricoides*, where parasite eggs or cysts are expelled in the feces of infected hosts and can contaminate soil, water, surfaces, or food. Humans or animals contract these parasites by ingesting contaminated food or water, or through contact with contaminated surfaces followed by touching their mouths. Additionally, direct contact transmission occurs when certain parasitic worms that can penetrate the skin are passed directly from one person to another or from animals to people. Vector-borne transmission is also significant, with certain parasites like tapeworms being carried by fleas or lice that infect cats, dogs, and potentially humans when these vectors are swallowed during grooming or biting. Moreover, environmental exposure to areas contaminated with infected feces, such as beaches, sandpits, or fields, poses a risk where individuals can acquire parasites by touching these contaminated environments and subsequently ingesting the eggs or cysts inadvertently. In areas like México where millions of cats and dogs roam the streets, the prevalence of intestinal parasites in these areas (especially those with soft, desirable substrates) is extremely high. In humans, roughly 28-30 million cases of helminthiasis (intestinal parasite infection) are reported in México annually, which is a staggering figure at roughly 20-23% of the country's population of 130.7 million people. Additionally, helminthiasis is considered a neglected tropical disease – meaning it is chronically overlooked despite the devastating health, social and economic consequences and thrives easily in tropical climates.

Dirofilaria, or heartworms, are bloodborne parasites spread by the bite of mosquitos. It was previously believed that heartworm disease was an ailment specific to canine and feline species, however it has recently proven to have some zoonotic potential. In humans, infection with *dirofilaria* can cause nodules within the lungs that are indistinguishable from cancerous growths. Additionally, they can migrate and grow painfully within the eyeballs and subcutaneous tissues, and can cause chest pain, bloody cough, general malaise and fever. Treatment is usually surgical. Heartworm disease is a serious and oftentimes fatal condition that is also very painful and expensive to treat, with the cost of treatment (consisting of a series of deep injections into the muscle surrounding the spine and taking a minimum of 12 months to complete) generally beginning at roughly \$2,000 USD – in comparison, preventative treatment is often \$5 - \$10 USD per month. The heartworm larvae migrate through the bloodstream and make their way to the heart and pulmonary arteries, where they grow to maturity over roughly six months and can reach up to 12 inches in length. The lifespan of a heartworm is 5-7 years in dogs and 2-3 years in cats – there is no successful treatment for heartworm disease in cats, and the patient will often succumb to heart failure as the first symptom observed is commonly collapse and/or sudden death. As the disease progresses, symptoms may include a persistent cough, exercise intolerance, fatigue after minimal activity, decreased

appetite, weight loss and anaphylaxis. As the number of worms in the heart and lungs increases, dogs can develop heart failure and severe fluid retention. Cats may exhibit signs such as coughing, asthma-like attacks, periodic vomiting, lack of appetite, or weight loss.

- **Provide methods of permanent identification**

Permanent identification of animals plays a crucial role in reducing instances of animal loss and abandonment by facilitating the reunion of pets with their families. Additionally, such identification systems can provide essential data on the average lifespan of the animal population. They also help in tracking sterilized animals, offering insights into the prevalence of sterilization within specific areas. This data can further assist in understanding the frequency of recurring diseases within the animal population, enhancing targeted health interventions and monitoring efforts.

- **Collect data from biologic samples**

The data gathering process from biological samples collected from stray animals in México presented significant challenges for this proposal, primarily due to the scarcity of recent and comprehensive studies despite obvious impacts on public health. Recognizing the urgent need for updated and consistent data, our initiative aims to systematically collect samples from these populations. This effort is critical not only to bolster the case for funding of accessible veterinary care in México but also to elevate the overall care standards for animals. Additionally, by improving the health of stray animal populations, we aim to mitigate the risks of zoonotic diseases and public health risks.

KEY STAFF MEMBERS

GOPAW will employ two Mexican licensed veterinarians and three support staff with at least two years of veterinary surgical experience. Daily operations of GOPAW will be managed by the veterinarians in conjunction with a director appointed by the organization to oversee larger-scale operations. Ongoing surgical technique training will be provided by a veterinarian specializing in high-quality high-volume spay/neuter appointed by the organization. Volunteer veterinarians will be used for training purposes, as necessary.

EVALUATION

The success of this project will be assessed using a comprehensive data collection framework centered around biological samples collected from animal patients. Each animal will be equipped with a permanent identification marker, enabling the consistent tracking of individual health outcomes over time. The primary biological samples to be analyzed include blood and feces, with a particular focus on identifying and quantifying zoonotic risks. These samples will provide critical insights into the presence and progression of zoonotic diseases within the animal population, serving as key indicators of public health risk.

Key evaluation metrics are to include prevalence of zoonotic diseases, health trends over time, sterilization rates and rates of recurrence of disease. Data will be analyzed using statistical software to provide robust quantification and analysis of trends. This will include time-series analysis to monitor changes over the project's duration and regression models to identify factors that significantly affect health outcomes.

Evaluation findings will be reported bi-annually in a comprehensive report. These reports will not only document progress but also guide any necessary adjustments to the project strategies to enhance outcomes and efficiency. By employing rigorous data collection and analysis methods, this evaluation will provide a clear measure of the project's impact on improving animal health standards and reducing the spread of zoonotic diseases, thereby supporting the broader goal of enhancing public health and animal welfare in the community.

BUDGET INFORMATION

Projected annual budget breakdown is as follows:

EXPENSE DESCRIPTION	EXPENSE AMOUNT	EXPENSE FREQUENCY	QUANTITY	TOTAL EXPENSE
<i>Office Rent</i>	650	Monthly	12	7,800
<i>Staff Surgeon</i>	12,500	Annually	2	25,000
<i>Veterinary Assistant</i>	8,500	Annually	2	17,000
<i>Surgery Table</i>	500	One Time	2	1,000
<i>Rabies Vaccinations, per 50 Vaccines</i>	129.15	Daily	200	25,830
<i>DHLPP Vaccines, per 25 Vaccines</i>	220.85	Daily	200	44,170
<i>FVRCP Vaccines, per 25 Vaccines</i>	125.83	Daily	200	25,166
<i>Microscope</i>	150	One Time	1	150
<i>Miscellaneous Supplies (Syringes, Needles, Clippers, Blades, Antiseptics, Disinfectants, etc.)</i>	2,580.00	Monthly	12	30,960
<i>Heartworm Antigen Tests, per 100 tests</i>	261.11	Weekly	50	13577.72
<i>Feline Leukemia Combo Tests, per 30 tests</i>	275.00	Twice Weekly	100	27,500
<i>Feline Leukemia Vaccines, per 25 Vaccines</i>	338.80	Twice Weekly	100	33,880
<i>Anthelmintic Medications</i>	15.53	Bi-weekly	50	776.50
			ESTIMATED TOTAL (USD)	\$191,430.22 (252,810.22 with FeLV initiatives)

These figures are based on a four-day workweek for fifty weeks each year, with an anticipated daily caseload of twenty-five cats and twenty-five dogs. Supply costs reflect current pricing available to the parent company, Central Ohio's Programs for Animal Welfare, which includes significant non-profit discounts. Monthly office rent is estimated based on typical commercial rates for a suitably sized space, inclusive of utilities. Under these conditions, the average daily operating cost is estimated at 957.15 USD. Due to the higher expenses involved in feline leukemia testing and vaccination, the campaign will prioritize other core initiatives initially, adding feline leukemia services as funding permits. Based on the above figures, the campaign would service approximately 10,000 animals per year at a cost of 19.41 USD per animal.

To protect the organization's finances, staff will be paid hourly. Veterinarians will earn 125 MXN (6.25 USD) per hour, while technicians will earn 85 MXN (4.25 USD) per hour. The projected salaries above are calculated for a 40-hour workweek over 50 weeks annually. These figures correspond with 2020 data from the *Gobierno del Estado de Oaxaca database*, indicating an average annual veterinarian salary of 204,511.20 MXN, as well as 134,691 MXN for assistants and 162,839 MXN for technicians within Oaxaca.

TIMELINE OF ACTIVITIES

FEBRUARY 2025 – ONGOING

- Solicitation of donations – monetary and in-kind (if acceptable for international transport).
- Submission of grant proposals to include categories such as vaccinations, pharmaceuticals, general supplies, equipment, such as cages, diagnostic tests and sample collection equipment, personal protective equipment (PPE).
- Establish Global Outreach Programs for Animal Welfare as an *asociacion civil* and subsidiary of Central Ohio's Programs for Animal Welfare, for official recognition as Mexican non-profit organization.
- CEO will visit Oaxaca from February 9, 2025 – March 16th, 2025 to visit properties, confirm complete filing of establishing documentation in México with a credentialed notaria publica, and meet with key personnel organizing adjacent businesses in Oaxaca in an effort to create partnerships to support struggling animal welfare organizations.

JULY - AUGUST 2025

- Secure a business location.
- Transport existing equipment, to include anesthesia machine, monitoring equipment, surgical instruments and key medications and husbandry supplies into México from existing clinic in the United States. Purchase additional supplies as necessary.
- Begin hiring key staff members, provide necessary training.
- Establish relationships with veterinary pharmaceutical companies and distributors for the purchase of veterinary drugs and supplies.

OCTOBER 2025 – DECEMBER 2025

- Provide veterinary care and data collection as outlined in this proposal.

MONTHLY

- Evaluate trends in biological data from collected samples.

QUARTERLY

- Provide high-quality high-volume surgical technique training to Mexican veterinarians employed by the organization from veterinarian trained in high-quality, high-volume spay/neuter technique.

DATA REFERENCES

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- Rabies-positive Bat Species in México: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4325525/>
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- Reported Cases of Human Leptospirosis Infections in México: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4514770/>
- Prevalence of Leptospirosis Among Mexican Dogs: <https://www.scirp.org/journal/paperinformation?paperid=72908>
- General Feline Calicivirus Information: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7117452/>
- General Feline Panleukopenia Information: <https://www.merckvetmanual.com/cat-owners/disorders-affecting-multiple-body-systems-of-cats/feline-panleukopenia>
- Mortality Rate Amongst Cats Infected with Panleukopenia: <https://www.msdsvetmanual.com/generalized-conditions/feline-panleukopenia/feline-panleukopenia#:~:text=Feline%20panleukopenia%20has%20a%20noticeably,CPV%20enteritis%20survived%20to%20discharge.>
- Oaxacan Economic Data: <https://www.economia.gob.mx/dataMéxico/en/profile/geo/oaxaca-oa>
- An epidemiological study of intestinal parasites of dogs from Yucatan, México, and their risk to public health: <https://pubmed.ncbi.nlm.nih.gov/21395413/>
- Stray Dog Population in a City of Southern México and Its Impact on the Contamination of Public Areas: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6176319/>
- Mexican Population Data: <https://www.census.gov/popclock/world/mx>
- Cases of Helminthiasis in México and Helminthiasis as a Neglected Tropical Disease: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3313919>
- Neglected Tropical Diseases: https://www.who.int/health-topics/neglected-tropical-diseases#tab=tab_1
- Heartworm Disease: <https://www.heartwormsociety.org/heartworms-in-dogs><https://www.heartwormsociety.org/heartworms-in-dogs>
- Zoonotic Potential of Heartworm Disease: <https://www.vin.com/apputil/content/defaultadv1.aspx?pld=11196&id=3854127&print=1#:~:text=Zoonotic%20dirofilariosis%20is%20caused%20by,with%20pulmonary%20neoplasia%2C%20while%20D.>
- Dirofilariosis in the Americas: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3851770/>