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Research Article

Economic and Veterinary Evaluation of Pet Insurance in Türkiye: Potential, Role in Health, and Impact on Practice

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Abstract

Pet insurance has emerged as a critical financial tool in developed markets for both animal health management and veterinary practice sustainability, driven by rising global pet ownership, increasing veterinary costs, and extended companion animal lifespans. Insurance mitigates financial barriers for pet owners, improves access to services, and reduces the risk of economic euthanasia. The benefits extend to veterinarians, too, by facilitating treatment decisions and thus strengthening the client–veterinarian relationship. However, despite high adoption rates in countries like Sweden and Germany, the market formation in Türkiye is in its infancy, characterized by limited penetration and public awareness. This study aims to evaluate the potential economic and veterinary outcomes of introducing pet insurance in Türkiye using a scenario-based simulation approach. Three scenarios were developed according to different microchipping and market penetration assumptions. Insurance products currently offered in Türkiye were examined to determine three representative premium levels, which were applied across scenarios to estimate Gross Written Premium, expected claims, and technical profitability. Analyses indicate that even a 5% penetration rate could generate an annual Gross Written Premium volume exceeding TRY 400 million. The findings highlight the insurance's potential to support the financing of the veterinary sector, expand preventive care, and enhance owner affordability. From a welfare perspective, insurance adoption can improve early diagnosis and reduce treatment abandonment, thereby elevating animal welfare. The research underscores the dual economic and ethical role of insurance as both a market instrument and a public good in animal health management. Ultimately, the study points to the need for awareness campaigns and supportive policy frameworks for the future development of the Turkish market.

Keywords: Animal welfare, Companion animals, Healthcare access, Pet insurance, Veterinary medicine

Introduction

The global increase in pet ownership, driven by urbanization and rising animal welfare awareness, has led to a significant increase in demand for veterinary health services and a resulting economic burden on owners. Pet owners increasingly view their animals not merely as property but as family members [1-5]. This trend is particularly evident among younger generations, where prioritizing pet health is common [5]. Globally, pet populations exceed 1 billion, with more than half of the world's population owning at least one pet [6]. Regions like the EU, China, and the United States hold the largest pet populations [6].

In this context, pet insurance has emerged as a crucial financial tool to manage substantial veterinary costs, from regular check-ups to chronic disease treatments. Pet insurance functions similarly to human health insurance, with owners paying a premium to cover a portion or the entirety of veterinary expenses, though policy specifics (e.g., pre-existing conditions) vary [7]. This insurance type has achieved high prevalence in some European countries, such as Sweden (where over 40% of pets are insured), though overall adoption remains low in many developing and large markets, including the United States [8].

From a veterinary perspective, pet insurance is vital for animal welfare and the sustainability of clinical practice. Insured pets benefit from better access to regular care and early diagnosis, improving overall quality of life [9]. Studies confirm that insurance facilitates the recording and treatment of common and complex diseases at a higher rate [10,11], allowing veterinarians to practice evidence-based medicine [12]. The availability of insurance provides a necessary safeguard against the rapidly rising costs of veterinary services, especially given the increasing prevalence of chronic diseases and longer lifespans in

pets [13-15]. Research indicates that insured households are more likely to pursue recommended treatments [10,11] and report lower levels of "economic euthanasia", where pets are euthanized due to unaffordable treatment costs [16]. Despite these benefits, challenges remain, including owners' limited understanding of policy coverage and exclusions, which can lead to dissatisfaction [7,17]. Lack of owner awareness is cited as a major barrier to wider adoption [18,19].

In Türkiye, the insurance market generally remains underdeveloped compared to OECD averages, with an overall insurance penetration rate below 2.5% [20]. Nevertheless, the market exhibits remarkably high nominal growth rates across several non-life insurance classes, suggesting significant potential for emerging segments [20]. Pet insurance is a nascent field in Türkiye, gaining wider recognition around 2015. Current products typically focus on accident and emergency medical expenses rather than comprehensive health coverage, covering issues like traffic accidents, fractures, and accidental injuries [21]. Currently, there are no official sector-wide statistics on pet insurance penetration rates in Türkiye. However, the high growth potential is supported by key factors: the significant companion animal population (approximately $4.7 million domestic cats and $1.4 million domestic dogs) [22], and mandatory microchipping regulations which have established a foundational database of over $2 million registered companion animals, a key precondition for many insurance policies [23].

Given the documented global benefits of pet insurance on animal welfare [10,11,16] and the high growth dynamics of the Turkish insurance sector [22], a critical gap exists in understanding the potential market scale and financial viability of pet insurance in Türkiye. This study aims to quantify and evaluate the current situation and potential development areas for pet insurance in Türkiye through a scenario-based simulation. Specifically, this study investigates the potential impacts of introducing pet insurance in Türkiye by modeling key financial indicators (premium and claims flow) under varying market penetration and registration assumptions. This research offers new insights for both the insurance industry and veterinary professionals by combining economic and animal welfare perspectives.

Material and Methods

Ethical Statement

This study did not involve any procedures requiring ethical approval.

Compilation of Supplementary Data and Visuals

Based on the information obtained from the publications cited in the introduction, a map showing pet ownership rates across the world was created to provide a global context for the study. The multifaceted advantages of pet insurance, including persistent challenges and limitations, were summarized and structured into a table format by synthesizing the information gathered from the literature review. This synthesized framework provides an overview of the benefits for different stakeholders, including pet owners, veterinarians, and companion animals.

Data Sources and Scope

The analysis relies on a simulation model built upon publicly available market data and primary market research. The key data sources used to define the scope and parameters of the simulation are as follows:

- *Companion Animal Population:* The total companion animal population in Türkiye (approximately 4.7 million cats and 1.4 million dogs) was estimated using figures derived from the European Pet Food Industry Federation (FEDIAF) [22].
- *Microchipping Data:* Data concerning the baseline number of microchipped and registered companion animals (cats, dogs, and ferrets) in Türkiye (2.031.112 total) were sourced from the Ministry of Agriculture and Forestry as of January 1, 2021 [23].
- *Market Parameters and Product Analysis:* The range for the annual premium (TRY 3.500 - TRY 5.000) and the typical coverage details used in the simulation were derived from a detailed primary review and analysis of pet insurance products offered by the main insurers operating in the Turkish market [21]. This review specifically encompassed the offerings from:
  - Türkiye Sigorta - "Sempati" pet insurance (standard and comprehensive packages).
  - Allianz Sigorta - "Sevimli Dostum" pet insurance (various coverage limits).
  - AXA Sigorta - pet insurance (five package options).
  - Anadolu Sigorta - "Patim Güvende" pet insurance (Basic and Plus packages).
  - Zurich Sigorta - "Neşeli Patiler" pet insurance (Standard and Premium packages).
  - Magdeburger Sigorta - "Can Dostum" pet insurance (single package).
  - Fiba Sigorta - "Fi-Pati" pet insurance (SOS, Mini, and Maxi packages; no upper age limit for Mini and SOS options).
  - AK Sigorta - "Pati" pet insurance (Basic, Plus, and Plus-VetAmerikan packages).

The analysis focused on standard or 'mini' packages to establish the baseline market pricing and coverage assumptions utilized in the simulation. An examination of pet insurance products available in the Turkish insurance market reveals that standard or 'mini' packages typically offer treatment coverage (including emergency, outpatient, or inpatient care) ranging from 25.000 TRY to 35.000 TRY, and third-party liability coverage between 10.000 TRY and 20.000 TRY. It was observed that the annual premium for these basic policies is generally between 3.500 TRY and 5.000 TRY. As policy coverage is expanded, annual premiums can increase significantly, reaching up to 25.000 TRY.

Simulation Model and Calculation Methodology

To assess the potential size and financial performance of the pet insurance market in Türkiye, a quantitative simulation model was developed using Python (Jupyter notebook).

Scenario Definition

Three distinct simulation scenarios were defined based on varying assumptions regarding the penetration rate of microchipping among the total companion animal population (cats and dogs). Scenario 1 represents the current market, with approximately 2.03 million microchipped cats and dogs. Scenario 2 assumes that the microchipping rate increases to 60% of the total pet population (around 3.66 million animals), while Scenario 3 assumes an 80% rate (about 4.88 million animals), reflecting a possible outcome of wider regulatory enforcement. Within each scenario, different market penetration rates (1%, 5%, and 10%) were considered to estimate the number of potential policies sold. The annual premium was assumed to range between TRY 3,500 and TRY 5,000, corresponding to typical "standard" or "mini" packages offered by insurers in Türkiye.

Financial Indicators and Formulas

For each combination of scenario and market penetration rate, three key financial indicators were calculated:

- **Gross Written Premium (GWP):** the total amount of premiums collected, representing the nominal size of the market. The calculation of GWP utilized three distinct premium levels for the premium per policy: 3.500 TRY (Low), 4.250 TRY (Medium), and 5.000 TRY (High).
- **Expected Claims (EC):** the estimated total value of claims to be paid by insurers, derived from an assumed **loss ratio** of 60-70%, meaning that insurers are expected to pay out 60-70% of collected premiums as claims. EC = GWP x Loss Ratio
- **Technical Profit (TP):** the residual amount after deducting both claims and operational expenses (assumed at 20% of GWP) from total premiums, representing the insurer's underwriting margin. Technical Profit = GWP × (1 − Loss Ratio − Expense Ratio)

While these ratios are benchmarked against mature markets, their application to the Turkish context is justified by two specific market dynamics. First, the 60-70% loss ratio aligns with the target technical profitability thresholds required for long-term sustainability in the Turkish non-life insurance sector, ensuring that the product remains valuable to the consumer without eroding the insurer's capital base. Second, the 20% operating expense ratio is predicated on a 'digital-first' distribution strategy. Given Türkiye's high mobile internet penetration and the growing trend of direct-to-consumer sales in niche insurance products, it is assumed that reduced intermediary commissions and automated underwriting will keep operational costs significantly lower than traditional agency-based models.

Results

The global distribution of pet ownership rates, compiled from various international publications, is presented in *Fig. 1* to provide a contextual overview of the market landscape.

Table 1 summarizes the multifaceted advantages of pet insurance for different stakeholders, including pet owners, veterinarians, and companion animals. In addition, it highlights persistent challenges and limitations that may hinder broader adoption and effective utilization of such policies.

The simulation results reveal that the potential size of the pet insurance market in Türkiye is highly sensitive to both the level of market penetration and the spread of microchipping among companion animals. *Fig.2* illustrates the impact on Gross Written Premium (GWP) across three different premium levels for the current microchipping rate of 2.03 million and hypothetical microchipping rates of 60% and 80, respectively, as

Fig 1. Pet Ownership Rates Worldwide

Table 1. *Comparative overview of pet insurance: advantages for pet owners, veterinarians, and pets, alongside key challenges and limitations*

Advantages for Pet Owners	**Advantages for Veterinarians**	**Advantages for Pets**
Reduces out-of-pocket veterinary expenses Increases access to advanced treatments Provides financial security in emergencies Enhances pet welfare and life expectancy	Reduces financial conflicts with clients Increases treatment acceptance rates Enables focus on best medical options, not just affordability Strengthens trust and communication with owners	Decreases euthanasia rates Access to better care opportunities Regular veterinary check-ups Longer lifespan Access to advanced technology-based treatments
Challenges and Limitations		
Lack of awareness and understanding among owners Insufficient promotion and education about policies Affordability issues: premiums + veterinary bills still costly for some owners Variability in policy coverage across companies Lack of a widespread insurance culture Limited marketing and promotional efforts for pet insurance		

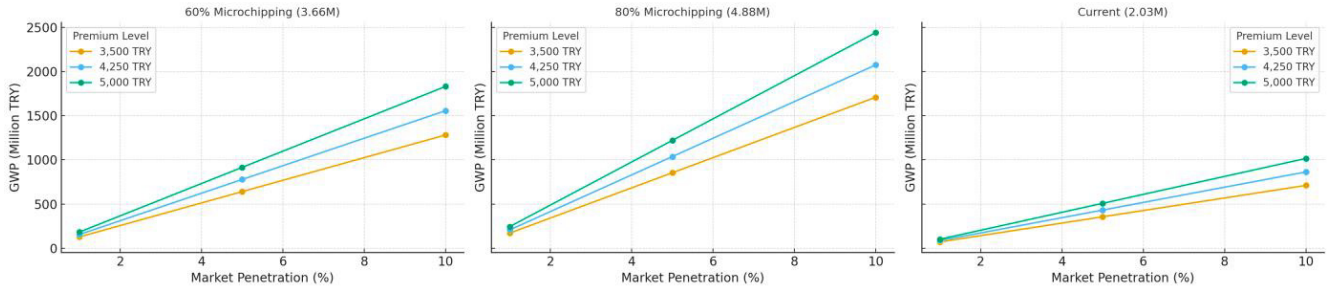

Fig 2. Simulated Gross Written Premium vs Market Penetration across microchipping scenarios

market penetration increases. It is evident that GWP is substantially and linearly affected by the increases in both the chipping rate and penetration.

Table 2 demonstrates that at 5% market penetration within the current microchipped population, total GWP increases proportionally with higher premium levels, while the Expected Claims (EC) calculated as a fixed proportion of GWP according to the assumed loss ratio (60-70%) follow the same upward pattern. The **Technical Profit** narrows significantly as the loss ratio increases from 60% to 70%, highlighting the critical importance of accurate risk pricing and claims management in sustaining profitability.

Table 3 compares alternative scenarios based on higher microchipping rates (60% and 80% of the total pet population). Under constant pricing and penetration assumptions (TRY 4.250 annual premium, 5% market penetration, 70% loss ratio), the overall premium volume rises from TRY 432 million in the current situation to TRY 1.04 billion in the 80% microchipping scenario-an increase of more than 140%. This illustrates the direct link between regulatory enforcement of pet registration and the expansion potential of the insurance market.

A comparative evaluation of the simulation outcomes demonstrates clear quantitative differences across scenarios. For the current microchipped population, increasing the annual premium from TRY 3.500 to TRY 5.000 results in a proportional increase in Gross Written Premium of approximately 43%, while Technical Profit increases by a similar magnitude under a constant loss ratio. However, changes in the assumed loss ratio exert a markedly stronger effect on profitability: increasing the loss ratio from 60% to 70% leads to an average reduction of nearly 50% in Technical Profit across all premium levels. This highlights that underwriting performance and claims management play a more critical role in financial sustainability than premium pricing alone.

In contrast, scenario comparisons based on microchipping coverage reveal that structural market expansion has the greatest impact on overall market size. Holding premium level, penetration rate, and loss ratio constant, increasing microchipping coverage from the current level to 80% of the pet population results in more than a twofold increase in Gross Written Premium. These comparative findings indicate that regulatory enforcement of pet registration and identification may generate substantially larger market gains than isolated adjustments in pricing or penetration strategies.

From a policy and strategic perspective, these results suggest that further institutional encouragement of pet registration and awareness programs could substantially accelerate the development of the pet insurance sector in Türkiye. Even at conservative penetration levels, the

Table 2. Financial outcomes for current microchipped pets

Annual Premium (TRY)	Loss Ratio (%)	GWP (TRY)	EC (TRY)	TP (TRY)
3.500	60	355.446.000	213.267.600	71.089.200
3.500	70	355.446.000	248.812.200	35.544.600
4.250	60	431.873.000	259.123.800	86.374.600
4.250	70	431.873.000	302.311.100	43.187.300
5.000	60	507.778.000	304.666.800	101.555.600
5.000	70	507.778.000	355.444.600	50.777.800

GWP: Gross Written Premium; EC: Expected Claims; TP: Technical Profit

Table 3. Comparison of chip scenarios

Chip Scenario	Microchipped Count	GWP (TRY)	EC (TRY)	TP (TRY)
Current Microchipped	2.031.112	431.613.000	302.129.100	43.161.300
Chip Rate 60%	3.660.000	777.750.000	544.425.000	77.775.000

GWP: Gross Written Premium; EC: Expected Claims; TP: Technical Profit

segment has the potential to contribute meaningfully to the non-life insurance portfolio, while also promoting responsible pet ownership and financial resilience among households.

Discussion

Pet insurance systems have been shown internationally to support improved access to veterinary care, reduce financial barriers for pet owners, and enhance continuity of treatment [6,24]. It is supported by recent studies that, particularly in nations with a high prevalence of pet insurance, the insurance elevates veterinary expenditure among pet owners and enhances access to advanced diagnostic and therapeutic modalities. Furthermore, evidence suggests that pet insurance facilitates client compliance with complex treatment plans, which veterinarians note can reduce cost pressure during clinical decision-making [25,26]. Consequently, this development may indirectly contribute to the enhanced predictability of veterinary clinics' revenue streams [25]. Similarly, North American industry data indicate that insured pets receive more diagnostic and preventive services, demonstrating the role of insurance in promoting better clinical outcomes and reducing cost-driven treatment delays [8]. These global experiences suggest that structured insurance adoption may serve as a catalyst for strengthening veterinary healthcare systems in emerging markets, including Türkiye. Building upon these findings, the present study contributes by providing a macroeconomic and simulation-based evaluation of how expanding pet insurance coverage could affect the financial stability of veterinary practices in an emerging market context such as Türkiye.

The scenario-based simulation not only demonstrates the potential financial outcomes for insurers but also provides valuable insights into the implications for veterinary professionals, pet owners, and overall animal welfare.

Scenario 1 (Current microchipped population) reflects the current status of the Turkish pet market, in which approximately two million registered animals could generate around TRY 430 million in premium volume at a moderate adoption rate of 5%. Although this scenario indicates an emerging market, the relatively limited insurance coverage implies that the majority of veterinary expenses are still paid out-of-pocket. Consequently, veterinarians continue to face situations where pet owners may delay or avoid necessary treatments due to cost constraints, leading to suboptimal health outcomes.

Scenario 2 (60% microchipping penetration) represents a more proactive regulatory environment, with approximately 3.6 million registered pets. Under this assumption, the total premium volume could exceed TRY 770 million, providing a significantly larger financial buffer for both pet owners and veterinary practices. In this context, pet insurance can improve treatment accessibility, allowing veterinarians to offer more comprehensive diagnostic and therapeutic procedures. The stabilization of payment streams may also enable clinics to invest in advanced medical equipment and staff training, indirectly enhancing the quality of care.

Scenario 3 (80% microchipping penetration) reflects a mature and well-regulated market. The potential premium volume surpassing TRY 1 billion implies widespread adoption of financial protection for pet health. This would fundamentally shift the dynamics of small animal practice in Türkiye. Routine and preventive care such as vaccinations, dental treatments, and chronic disease management would likely become more standardized, as insurance coverage reduces economic hesitation among pet owners. For veterinarians, this evolution could result in more predictable caseloads, better client compliance, and reduced ethical stress associated with cost-driven treatment refusals.

Across all scenarios, the introduction and expansion of pet insurance can generate a positive feedback loop between financial protection, early intervention, and overall animal welfare. As the insured population grows, veterinary clinics could experience improved liquidity and planning capacity, which in turn supports sustained investments in public health and zoonotic disease prevention.

This study demonstrates that the expansion of pet insurance in Türkiye could have substantial financial and societal benefits, extending beyond the insurance sector itself. The scenario analyses indicate that even moderate increases in market penetration driven by broader microchipping

compliance could generate hundreds of millions of Turkish Lira in premium volume, creating a more resilient and accessible ecosystem for veterinary healthcare. From a veterinary perspective, the availability of pet insurance directly translates into improved treatment accessibility, earlier disease detection, and enhanced continuity of care. The mitigation of financial constraints reduces the frequency with which veterinarians encounter ethical dilemmas, lowers the necessity to modify treatment protocols due to cost, and even decreases the incidence of cost-driven euthanasia decisions [27].

International experience from developed pet insurance markets demonstrates that insurance penetration is often supported by complementary public policies and institutional arrangements [28]. However, the transferability of these models to emerging markets requires careful adaptation to local regulatory frameworks. In developed markets like Sweden and the United Kingdom, strong animal registration systems and data integration have enhanced market transparency, facilitating more accurate risk pooling for pet insurance schemes [28,29]. Academic and policy discourses increasingly advocate for the establishment of subsidized veterinary care programs or safety nets to assist low-income households with preventive and catastrophic expenses [30]. Furthermore, the integration of pet insurance into employee benefit packages has emerged as a significant mechanism to encourage voluntary participation and expand coverage, particularly in the North American market [8]. Collaborative models involving direct billing systems and streamlined claims processing have significantly reduced financial barriers for owners and administrative burdens for clinics, thereby improving overall service accessibility [31]. Consequently, these mechanisms not only ensure financial sustainability but also foster a culture of responsible pet ownership.

Several limitations of the present study should be acknowledged. First, the scenario-based simulation relies on assumed loss ratios and operating expense levels derived from international literature, which may not fully capture the heterogeneity of the Turkish insurance and veterinary markets. Second, behavioral responses of pet owners and veterinarians to insurance adoption were not directly modeled and may influence real-world outcomes. Third, the study does not explicitly account for the impact of high inflation on claim severity, which represents a significant external risk factor for pricing stability in the current economic climate.

Despite these limitations, the findings offer meaningful guidance for policy and practice. In the Turkish context, targeted education and awareness campaigns aimed at pet owners and veterinary professionals could improve insurance literacy and trust. Specifically, veterinary faculties should consider integrating insurance literacy modules into their curricula to prepare future practitioners for client financial counseling. Policy measures such as incentives for microchipping, pilot state-supported preventive care funds, and frameworks for structured collaboration through shared digital health data standards between insurers and veterinary clinics may further accelerate market development. Collectively, these strategies could enhance financial predictability for veterinary practices, improve access to care, and strengthen animal welfare outcomes.

At the policy level, integrating pet insurance within a broader framework of animal registration and welfare legislation could yield significant public health gains. Encouraging microchipping and promoting insurance literacy among pet owners should therefore be considered complementary strategies. For veterinary practitioners, collaborating with insurers to design transparent, needs-based coverage options could reduce the ethical and financial dilemmas frequently encountered in small animal practice. Ultimately, a more structured and financially inclusive pet health system would strengthen not only the economic sustainability of veterinary services but also the overall wellbeing of companion animals in Türkiye.

Declarations

Availability of Data and Materials: All data supporting the findings of this study are included within the manuscript. Additional materials or simulation codes used in the analysis are available from the corresponding author upon reasonable request.

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