



Research Article

An Animal Health Economics Evaluation of Pet Health Insurance, Economic Euthanasia, and Dysthanasia

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ABSTRACT

Advances in companion animal medicine have substantially improved diagnostic and therapeutic capabilities but have also increased the financial burden of veterinary care. Rising treatment costs may contribute to economic euthanasia, whereas broader access to advanced interventions may also raise concerns regarding dysthanasia. Although pet health insurance has been proposed as a mechanism to improve access to veterinary care, its potential role in balancing these outcomes has received limited attention, particularly in Türkiye. This study evaluated the relationships among pet health insurance, economic euthanasia, and dysthanasia from an animal health economics perspective and examined their implications for companion animal welfare and veterinary healthcare in Türkiye. A scenario-based conceptual assessment was conducted using publicly available national datasets from the Companion Animal Registration System operated by the Republic of Türkiye Ministry of Agriculture and Forestry (PETVET), the Insurance Association of Türkiye (TSB), the Insurance and Private Pension Regulation and Supervision Agency (SEDDK), and the European Pet Food Industry Federation (FEDIAF), together with evidence synthesized from the international scientific literature. Four hypothetical insurance coverage scenarios (5%, 10%, 20%, and 40%) were developed to evaluate the potential implications of increasing insurance coverage. The scenario-based assessment suggests that financial barriers remain an important determinant of access to veterinary care and that increasing insurance coverage may improve access to recommended treatment while reducing the likelihood of economic euthanasia. However, broader utilization of advanced diagnostic and therapeutic interventions also highlights the importance of quality-of-life assessment and welfare-oriented clinical decision-making to minimize the potential risk of dysthanasia. Pet health insurance should be viewed not only as a financial protection mechanism but also as a component of animal health economics and animal welfare strategies. The proposed conceptual framework highlights important knowledge gaps and provides a foundation for future nationwide studies evaluating economic euthanasia, dysthanasia, and veterinary decision-making in Türkiye.

Keywords: Animal health economics, dysthanasia, economic euthanasia, pet health insurance, veterinary ethics

Evcil Hayvan Sağlık Sigortası, Ekonomik Ötenazi ve Distanazinin Hayvan Sağlığı Ekonomisi Açısından Değerlendirilmesi

ÖZET

Refakatçi hayvan hekimliğinde tanı ve tedavi olanaklarında yaşanan gelişmeler, veteriner sağlık hizmetlerinin etkinliğini önemli ölçüde artırmış, ancak aynı zamanda tedavi maliyetlerinin de yükselmesine neden olmuştur. Artan tedavi maliyetleri ekonomik ötenaziye yol açabilirken, ileri tanı ve tedavi uygulamalarına erişimin genişlemesi distanaziye ilişkin etik kaygıları da beraberinde getirebilmektedir. Evcil hayvan sağlık sigortası, veteriner sağlık hizmetlerine erişimi artırabilecek bir mekanizma olarak önerilmesine rağmen, özellikle Türkiye’de ekonomik ötenazi ile distanazi arasındaki denge üzerindeki olası etkileri yeterince araştırılmamıştır. Bu çalışmada, evcil hayvan sağlık sigortası, ekonomik ötenazi ve distanazi arasındaki ilişkiler hayvan sağlığı ekonomisi perspektifinden değerlendirilmiş ve bu ilişkilerin refakatçi hayvan refahı ile veteriner sağlık hizmetleri üzerindeki olası etkileri incelenmiştir. Çalışmada, T.C. Tarım ve Orman Bakanlığı tarafından yürütülen Ev Hayvanı Kayıt Sistemi (PETVET), Türkiye Sigorta Birliği (TSB), Sigortacılık ve Özel Emeklilik Düzenleme ve Denetleme Kurumu (SEDDK) ve Avrupa Evcil Hayvan Gıda Endüstrisi Federasyonu (FEDIAF) tarafından yayımlanan kamuya açık ulusal veriler ile uluslararası bilimsel literatürden sentezlenen kanıtlar kullanılarak senaryo temelli kavramsal bir değerlendirme gerçekleştirilmiştir. Sigorta kapsamındaki artışın olası etkilerini değerlendirmek amacıyla %5, %10, %20 ve %40 olmak üzere dört varsayımsal sigorta kapsamı senaryosu oluşturulmuştur. Senaryo temelli değerlendirme, finansal engellerin veteriner sağlık hizmetlerine erişimi belirleyen temel faktörlerden biri olduğunu ve sigorta kapsamının genişlemesinin önerilen tedavilere erişimi artırarak ekonomik nedenlerle tedavinin reddedilme olasılığını azaltabileceğini göstermektedir. Bununla birlikte, ileri tanı ve tedavi uygulamalarının daha yaygın kullanılması, distanazi riskinin en aza indirilebilmesi için yaşam kalitesinin sistematik olarak değerlendirilmesini ve hayvan refahını esas alan klinik karar verme süreçlerini gerekli kılmaktadır. Evcil hayvan sağlık sigortası yalnızca finansal koruma sağlayan bir mekanizma olarak değil, aynı zamanda hayvan sağlığı ekonomisi ve hayvan refahı stratejilerinin önemli bir bileşeni olarak değerlendirilmelidir. Önerilen kavramsal çerçeve, mevcut bilgi boşluklarını ortaya koymakta ve Türkiye’de ekonomik ötenazi, distanazi ve veteriner hekimlerin klinik karar verme süreçlerini değerlendirecek gelecekteki ulusal çalışmalar için bilimsel bir temel oluşturmaktadır.

Anahtar kelimeler: Hayvan sağlığı ekonomisi, distanazi, ekonomik ötenazi, evcil hayvan sağlık sigortası, veteriner etiği

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Introduction

Over the past two decades, companion animals have assumed an increasingly important role in modern society, accompanied by substantial advances in veterinary medicine. Developments in diagnostic imaging, minimally invasive surgery, intensive care, oncology, and specialized therapeutic interventions have considerably improved life expectancy and quality of life in companion animals. However, these advances have also increased veterinary healthcare expenditures, creating growing financial challenges for pet owners and veterinary professionals (Volk et al., 2011; Cooney and Kipperman, 2023).

Unlike human healthcare systems, veterinary services are financed predominantly through direct out-of-pocket payments. Consequently, owners' financial capacity has become a major determinant of access to veterinary care, particularly for advanced diagnostics, surgery, intensive care, and long-term disease management (Arrow, 1978; Lue et al., 2008). Financial barriers may therefore influence whether companion animals receive timely and appropriate treatment.

One important consequence of limited financial accessibility is economic euthanasia, defined as euthanasia performed primarily because owners cannot afford medically indicated treatment (Kipperman et al., 2017). Contemporary evidence suggests that economic euthanasia is not solely a financial issue but also reflects interactions among owner expectations, veterinarian–client communication, ethical responsibilities, and animal welfare (Cooney and Kipperman, 2023; Deelen et al., 2025). Conversely, dysthanasia refers to the unnecessary prolongation of life through medical interventions that provide little or no meaningful welfare benefit (Rollin, 2013). Current veterinary guidelines emphasize that end-of-life decisions should be guided by prognosis, quality of life, pain management, and animal welfare rather than by prolonging biological survival alone (Bishop et al., 2016; Kogan and Cooney, 2023; Selter et al., 2023; International Association for Animal Hospice and Palliative Care [IAAHPC], 2024; Yıldırım, 2025).

From an animal health economics perspective, economic euthanasia and dysthanasia represent two complementary consequences of healthcare resource allocation. While inadequate financial access may prevent animals from receiving appropriate treatment, extensive financial coverage may increase the use of advanced interventions that offer limited welfare benefits if not accompanied by evidence-based clinical decision-making (Pauly, 1968; Arrow, 1978; Rushton, 2017). Pet health insurance has therefore emerged as a potential mechanism for improving financial accessibility while supporting better clinical outcomes. Studies indicate that insured animals are more likely to receive recommended treatments and are less likely to undergo economic euthanasia than uninsured animals (Boller et al., 2020). Nevertheless, broader insurance coverage also

reinforces the importance of welfare-oriented decision-making to avoid unnecessary treatment and potential dysthanasia (Cooney and Kipperman, 2023).

Although pet health insurance has expanded considerably in several developed countries, its adoption in Türkiye remains limited. According to the European Pet Food Industry Federation (FEDIAF, 2023), Türkiye has approximately 4.7 million cats and 1.4 million dogs, while the Companion Animal Registration System operated by the Republic of Türkiye Ministry of Agriculture and Forestry (PETVET) has recorded more than two million registered companion animals. Despite this growing population, veterinary healthcare continues to depend largely on direct owner payments, highlighting the need for evidence-based evaluations of insurance systems that support animal welfare and healthcare accessibility (Insurance and Private Pension Regulation and Supervision Authority [SEDDK], 2024; Insurance Association of Türkiye [TSB], 2024; Gençgönül, 2026).

To the best of our knowledge, no previous study has comprehensively evaluated the relationships among pet health insurance, economic euthanasia, dysthanasia, and animal health economics within a scenario-based framework in Türkiye. Therefore, this study aimed to evaluate these interrelationships from an animal health economics perspective and to examine their potential implications for companion animal welfare, veterinary healthcare accessibility, and future policy development.

Materials and Methods

Study design

This study employed a scenario-based approach to animal health economics, utilizing publicly available national datasets and synthesizing evidence from the international scientific literature. The analytical framework was developed according to established principles of animal health economics, integrating epidemiological, economic, and policy evidence to support decision-making when primary field data are unavailable or limited. Scenario analysis was selected because no national surveillance system currently records the frequency of economic euthanasia, dysthanasia, or pet health insurance utilization in Türkiye. Consequently, scenario-based modelling provides a transparent and scientifically accepted framework for evaluating alternative policy options using the best available evidence.

Unlike conventional review articles, the present study combined secondary national data with predefined insurance coverage scenarios to evaluate the potential effects of pet health insurance on veterinary healthcare accessibility, economic euthanasia, dysthanasia, and animal welfare. Rather than simply summarizing the existing literature, the study developed a structured analytical framework to examine the interrelationships among these variables from an animal health economics perspective (Rushton, 2017).

Data sources

The analysis was based on publicly available secondary data obtained from official national institutions together with evidence synthesized from the international scientific literature. Information on the registered companion animal population in Türkiye was retrieved from the Republic of Türkiye Ministry of Agriculture and Forestry (PETVET, 2023). Information regarding the development of the pet health insurance market was derived from reports published by TSB (2024) and SEDDK (2024). Estimates of the companion animal population were supplemented using reports published by FEDIAF (2023).

Scientific evidence concerning economic euthanasia, dysthanasia, veterinary healthcare expenditures, quality-of-life assessment, ethical decision-making, and pet health insurance was synthesized from relevant peer-reviewed international publications. Particular emphasis was placed on studies examining the influence of financial constraints on veterinary treatment decisions (Kipperman et al., 2017; Moses et al., 2018), the association between pet insurance and clinical outcomes (Boller et al., 2020), and contemporary approaches to end-of-life decision-making, quality-of-life assessment, and animal welfare (Bishop et al., 2016; Cooney and Kipperman, 2023; Selter et al., 2023; IAAHPC, 2024; Deelen et al., 2025).

Development of scenario models

Because no national database currently records the incidence of economic euthanasia, dysthanasia, or pet health insurance utilization among companion animals in Türkiye, a scenario-based analytical framework was developed. Scenario analysis is widely used in animal health economics to evaluate alternative policy interventions under conditions of uncertainty and limited empirical data (Rushton, 2017).

Four hypothetical insurance penetration scenarios were constructed using the registered companion animal population in Türkiye as the reference population. Insurance coverage levels of 5%, 10%, 20%, and 40% were selected to represent progressive stages of market development. The initial scenario (5%) was based on previous national economic evaluations, which suggested that this level represents a realistic short-term target for the Turkish pet insurance sector (Gençgönül, 2026). The 10%, 20%, and 40% coverage levels were not derived from observed market trends or a forecasting model. Rather, they were constructed as exploratory hypothetical scenarios representing progressively broader levels of insurance penetration, allowing the potential implications of increasing coverage to be compared within a structured scenario-based framework.

The scenarios were not intended to predict future insurance penetration rates but rather to provide a structured analytical framework for examining how

increasing insurance coverage might influence access to veterinary healthcare, owner financial burden, treatment decisions, and animal welfare under different policy scenarios. The scenarios were evaluated qualitatively and were intended to support conceptual interpretation rather than quantitative prediction.

Conceptual framework

The analytical framework was developed from an animal health economics perspective by integrating concepts from veterinary economics, animal welfare science, and veterinary ethics. The framework was based on the premise that veterinary treatment decisions are influenced by interactions among financial accessibility, clinical prognosis, owner preferences, and quality-of-life considerations.

Within this framework, economic euthanasia was defined as the inability to pursue medically indicated treatment because of financial limitations (Kipperman et al., 2017), whereas dysthanasia was defined as the continuation of medical interventions despite limited expected welfare benefits (Rollin, 2013; Bishop et al., 2016).

Accordingly, pet health insurance was evaluated as a policy intervention with the potential to reduce financial barriers to veterinary care while increasing access to advanced medical procedures. Within the conceptual framework, insurance coverage was considered a factor that could influence both the likelihood of economic euthanasia and the potential risk of dysthanasia through changes in treatment accessibility and clinical decision-making.

Outcome measures

The primary outcome measures included veterinary healthcare accessibility, the potential reduction in economic euthanasia, reductions in owners' out-of-pocket veterinary expenditures, and improvements in animal welfare. Secondary outcome measures included the utilization of advanced diagnostic and therapeutic procedures, the potential risk of dysthanasia, implications for veterinary decision-making, and the efficient allocation of veterinary healthcare resources. Because nationally representative epidemiological data describing the frequency of economic euthanasia and dysthanasia are currently unavailable in Türkiye, all outcome measures were interpreted qualitatively based on published international evidence.

Evaluation criteria and evidence synthesis

The scenario analysis was guided by evaluation criteria derived from published evidence in veterinary medicine, animal welfare science, and animal health economics. Rather than estimating absolute numbers of economic euthanasia or dysthanasia cases, the analysis evaluated the expected direction and relative magnitude of change associated with increasing levels of pet health insurance coverage using evidence synthesized from previous studies. The qualitative rating system used in Table 2 (+

to +++) was intended solely to facilitate comparative interpretation across the four hypothetical scenarios. The symbols represent ordinal qualitative categories reflecting the expected direction and relative magnitude of change within the scenario-based framework; they do not represent empirically estimated effect sizes, probabilities, or a linear dose–response relationship.

Each insurance coverage scenario was evaluated across four complementary dimensions: economic, clinical, welfare, and policy. The economic dimension assessed financial accessibility to veterinary healthcare, reductions in owners' out-of-pocket veterinary expenditures, and the affordability of advanced veterinary treatment. The clinical dimension examined access to diagnostic procedures, surgical interventions, intensive care services, and acceptance of recommended treatment. The welfare dimension evaluated the potential reduction in economic euthanasia, preservation of animal quality of life, and the potential risk of dysthanasia. Finally, the policy dimension evaluated veterinary healthcare accessibility, the sustainability of pet health insurance systems, and the efficient allocation of veterinary healthcare resources.

The economic evaluation was supported by evidence demonstrating that pet health insurance reduces financial barriers to veterinary care, decreases owners' out-of-pocket expenditures, and improves access to diagnostic and therapeutic services (Arrow, 1978; Boller et al., 2020). The clinical dimension focused on the extent to which increasing insurance coverage could facilitate access to recommended diagnostic procedures, surgical interventions, intensive care services, and appropriate treatment options. The welfare dimension incorporated published evidence indicating that financial constraints remain a major cause of declining recommended treatment and may ultimately result in economic euthanasia (Kipperman et al., 2017; Cooney and Kipperman, 2023). In contrast, the potential risk of dysthanasia was interpreted within a welfare-oriented ethical framework, recognizing that treatment decisions should be guided by quality-of-life assessment, expected clinical benefit, and animal welfare rather than by treatment availability alone (Bishop et al., 2016; IAAHPC, 2024; Deelen et al., 2025).

Lastly, the policy dimension was interpreted within an integrated animal health economics framework in which financial accessibility, clinical decision-making, animal welfare, and the efficient allocation of veterinary healthcare resources were regarded as complementary components of sustainable veterinary healthcare policy (Rushton, 2017).

Ethical considerations

Ethical approval was not required for this study because it was based exclusively on publicly available secondary data, including official reports and published scientific literature. No live animals, animal owners, veterinarians, or human participants were directly involved, and no

identifiable personal or confidential data were collected or analyzed. Accordingly, approval from either an institutional animal care and use committee or a human research ethics committee was not required.

Conceptual model

A conceptual framework was developed to illustrate the hypothesized relationships among financial constraints, pet health insurance, veterinary treatment decisions, animal welfare, economic euthanasia, and dysthanasia within the scenario-based animal health economics assessment (Figure 1). The framework guided the development and interpretation of the insurance coverage scenarios and provided the conceptual basis for evaluating their implications from an animal health economics perspective. The framework was not intended to represent causal relationships but rather to summarize the conceptual pathways identified from the published literature (Kipperman et al., 2017; Boller et al., 2020; Cooney and Kipperman, 2023; Deelen et al., 2025) and applied throughout the scenario-based analysis.



Figure 1. Conceptual framework illustrating the hypothesized relationships among financial constraints, pet health insurance, access to veterinary care, economic euthanasia, animal welfare, potential overtreatment, and dysthanasia within the scenario-based animal health economics assessment.

Results

Current status of companion animals and pet health insurance in Türkiye

The available national and international data demonstrate that the companion animal population in Türkiye has increased substantially over the past

Table 1. Key indicators of companion animal population, registration, and pet health insurance in Türkiye

Variable	Value	Source
Registered companion animals	2,031,112	PETVET
Registered cats	1,209,672	PETVET
Registered dogs	821,400	PETVET
Registered ferrets	40	PETVET
Estimated cat population	4.7 million	FEDIAF (2023)
Estimated dog population	1.4 million	FEDIAF (2023)
Pet health insurance products	Available	TSB
Insurance market penetration	Limited	SEDDK; Gençgönül (2026)

decade. According to the PETVET, more than two million companion animals have been officially registered, whereas estimates reported by the FEDIAF indicate that the actual companion animal population is considerably larger. This discrepancy suggests that although national registration has expanded rapidly, a substantial proportion of companion animals remain outside the official registration system.

Despite the continuous growth of the companion animal population, the pet health insurance market in Türkiye remains at an early stage of development. National reports published by the TSB and the Insurance and SEDDK indicate that companion animal insurance currently represents only a limited segment of the insurance market. Consequently, veterinary healthcare expenditures continue to rely predominantly on direct owner payments.

The principal indicators describing the companion animal population, registration status, and current pet health insurance landscape in Türkiye are summarized in Table 1. Overall, these findings indicate increasing demand for veterinary healthcare services together with relatively limited financial protection mechanisms for companion animal owners.

PETVET (Companion Animal Registration System of the Republic of Türkiye Ministry of Agriculture and Forestry) data represent officially registered companion animals in Türkiye, whereas FEDIAF (European Pet Food Industry Federation) estimates refer to the total companion animal population. Information on pet health insurance was compiled from reports published by the Insurance Association of Türkiye (TSB), the Insurance and Private Pension Regulation and Supervision Agency (SEDDK), and Gençgönül (2026).

PETVET (Companion Animal Registration System of the Republic of Türkiye Ministry of Agriculture and Forestry) data represent officially registered companion animals in Türkiye, whereas FEDIAF (European Pet Food Industry Federation) estimates refer to the total companion animal population. Information on pet health insurance was compiled from reports published by the Insurance Association of Türkiye (TSB), the Insurance and Private Pension Regulation and Supervision Agency (SEDDK),

and Gençgönül (2026).

Scenario-based assessment of pet health insurance coverage

To explore the potential implications of expanding pet health insurance in Türkiye, four hypothetical insurance coverage scenarios were evaluated. The scenarios represented progressively increasing levels of insurance penetration within the companion animal population, corresponding to coverage levels of 5% (S1), 10% (S2), 20% (S3), and 40% (S4). These scenarios were assessed using the evaluation framework developed in this study together with evidence synthesized from published veterinary, animal welfare, and animal health economics literature. Rather than predicting future insurance uptake, the scenarios were intended to illustrate how increasing levels of insurance coverage could potentially influence veterinary healthcare accessibility, owner financial burden, treatment decisions, animal welfare, economic euthanasia, and the potential risk of dysthanasia.

Expected effects of increasing insurance coverage

The scenario-based assessment showed a progressive improvement in financial accessibility to veterinary healthcare across increasing insurance coverage scenarios. Higher coverage scenarios were characterized by reduced financial barriers to diagnostic and therapeutic services, greater access to recommended treatments, and more favorable expected animal welfare outcomes. The direction of these changes across the four evaluated scenarios is summarized in Table 2.

Potential influence on economic euthanasia

Across the four evaluated scenarios, increasing insurance coverage was associated with a progressive reduction in the expected likelihood of financially motivated treatment refusal. Accordingly, the potential reduction in economic euthanasia became greater as insurance coverage increased from 5% (S1) to 40% (S4). This pattern reflected improved financial access to medically indicated diagnostic and therapeutic procedures under the higher coverage scenarios, as summarized in Table 2.

Table 2. Expected effects of increasing pet health insurance coverage across the evaluated scenarios

Outcome	S1 (5%)	S2 (10%)	S3 (20%)	S4 (40%)
Financial accessibility	+	++	+++	++++
Access to veterinary care	+	++	+++	++++
Acceptance of recommended treatment	+	++	+++	++++
Reduction in owner financial burden	+	++	+++	++++
Potential reduction in economic euthanasia	+	++	+++	++++

(+) indicates the lowest and (++++) the greatest expected improvement across the hypothetical scenarios. These symbols represent ordinal qualitative categories derived from the evidence synthesized in this study and do not indicate empirically estimated effect sizes, probabilities, or a linear dose–response relationship.

Potential influence on dysthanasia

Across the four evaluated scenarios, higher insurance coverage was associated with greater expected access to advanced diagnostic and therapeutic interventions. The potential risk of dysthanasia was interpreted as increasing only when expanded treatment accessibility was not accompanied by appropriate quality-of-life assessment and welfare-oriented clinical decision-making. Thus, within the scenario-based framework, the relationship between increasing insurance coverage and the potential risk of dysthanasia was conditional rather than direct.

Discussion

The present study provides a scenario-based animal health economics evaluation of the relationships among pet health insurance, economic euthanasia, dysthanasia, and animal welfare in companion animal healthcare in Türkiye. The findings suggest that improving financial accessibility through pet health insurance may facilitate access to veterinary care and reduce economically motivated treatment refusal. However, broader access to advanced veterinary services also highlights the importance of welfare-oriented clinical decision-making to minimize the potential risk of dysthanasia.

Although the companion animal population in Türkiye has increased considerably (Erzurum and Kayar, 2025), pet health insurance remains at an early stage of development, and veterinary healthcare continues to rely predominantly on direct out-of-pocket payments. This imbalance may restrict access to advanced diagnostics, surgery, emergency care, and long-term treatment, particularly for owners with limited financial resources. Consistent with previous studies, financial constraints remain an important determinant of treatment acceptance and veterinary healthcare utilization (Arrow, 1978; Lue et al., 2008; Volk et al., 2011; Kipperman et al., 2017; Boller et al., 2020).

Pet health insurance has the potential to reduce unexpected financial burdens by improving access to recommended diagnostic and therapeutic interventions. Previous studies indicate that insured animals are

more likely to receive appropriate treatment and less likely to undergo economically motivated euthanasia (Boller et al., 2020). Nevertheless, treatment decisions are influenced not only by financial considerations but also by prognosis, expected quality of life, owner expectations, veterinarian–client communication, and ethical responsibilities (Cooney and Kipperman, 2023; Deelen et al., 2025). Consequently, insurance may be regarded as a mechanism that improves access to care rather than a substitute for evidence-based clinical judgement.

From an animal health economics perspective, pet health insurance extends beyond financial reimbursement and may function as a policy instrument that improves healthcare accessibility while supporting animal welfare. Integrating insurance systems with preventive healthcare, quality-of-life assessment, and welfare-oriented clinical decision-making may further enhance both clinical outcomes and the efficient allocation of veterinary healthcare resources.

Economic euthanasia represents one of the most important consequences of limited financial accessibility in companion animal practice. However, it may be better understood as a multifactorial phenomenon rather than simply as an inability to afford veterinary treatment. In addition to financial constraints, treatment decisions are influenced by disease severity, prognosis, owner expectations, emotional attachment, veterinarian–client communication, and ethical responsibilities (Cooney and Kipperman, 2023; Deelen et al., 2025). Consequently, economic euthanasia may reflect broader inequalities in access to veterinary healthcare rather than financial hardship alone.

Previous studies suggest that financial limitations may influence both clinical decision-making and veterinarians' professional well-being. Kipperman et al. (2017) reported that financial constraints may prevent veterinarians from providing the standard of care they consider medically appropriate, whereas Moses et al. (2018) identified financial restrictions as an important source of moral distress in companion animal practice. Similarly, Boller et al. (2020) showed that insured dogs

with gastric dilatation–volvulus were significantly less likely to undergo presurgical economic euthanasia, supporting the concept that reducing financial barriers may improve access to medically indicated treatment.

Although improved financial accessibility may reduce economically motivated treatment refusal, insurance alone cannot ensure appropriate clinical outcomes. End-of-life decisions may be more appropriately informed by prognosis, expected quality of life, animal welfare, and shared decision-making between veterinarians and owners (Cooney and Kipperman, 2023; Deelen et al., 2025). Effective communication may play an important role in helping owners make informed decisions during emotionally challenging situations and has been associated with greater caregiver satisfaction and lower decisional regret (Kogan and Cooney, 2026).

Empirical evidence regarding economic euthanasia in Türkiye remains limited. Despite the increasing companion animal population and gradual development of pet health insurance, nationwide epidemiological data describing the prevalence and determinants of economic euthanasia are currently unavailable. This highlights an important knowledge gap and emphasizes the need for future national studies evaluating the financial, clinical, and ethical factors influencing veterinary treatment decisions.

These findings naturally lead to the complementary challenge of dysthanasia. Whereas economic euthanasia results from inadequate access to medically indicated treatment because of financial constraints, dysthanasia concerns the continuation of treatment when further intervention is unlikely to provide meaningful welfare benefits. As veterinary medicine continues to expand its diagnostic and therapeutic capabilities, determining when treatment should be continued or discontinued has become an increasingly important ethical responsibility.

Current veterinary guidelines, including the American Animal Hospital Association/International Association for Animal Hospice and Palliative Care (AAHA/IAAHPC) End-of-Life Care Guidelines (Bishop et al., 2016), the AAHP/IAAHPC Feline Hospice and Palliative Care Guidelines (Eigner et al., 2023), and subsequent IAAHPC recommendations (2024), emphasize pain management, comfort, dignity, and individualized patient care. Accordingly, broader insurance coverage may be viewed as a mechanism for improving access to appropriate treatment rather than encouraging unnecessary diagnostic or therapeutic interventions.

Previous studies likewise indicate that prognosis, expected quality of life, owner preferences, and ethical responsibilities remain central to veterinary decision-making (Selter et al., 2023; Deelen et al., 2025). Therefore, increased financial accessibility may complement rather than replace evidence-based clinical judgement. Within the conceptual framework proposed in this study, dysthanasia is interpreted as a potential consequence of expanded treatment accessibility only when welfare-

oriented clinical decision-making is not maintained. This relationship may therefore be considered indirect rather than causal.

Taken together, economic euthanasia and dysthanasia represent two complementary challenges in companion animal healthcare. One reflects insufficient access to medically indicated treatment because of financial constraints, whereas the other reflects the continuation of treatment when meaningful welfare benefits are no longer expected. Achieving an appropriate balance between these outcomes may represent an important objective for veterinary healthcare systems.

From an animal health economics perspective, pet health insurance may be regarded as a policy instrument that improves financial accessibility while supporting equitable access to veterinary care. However, financial protection alone cannot guarantee optimal welfare outcomes. Insurance systems may therefore be implemented alongside evidence-based clinical guidelines, standardized quality-of-life assessment, and shared decision-making between veterinarians and owners to ensure that treatment decisions remain consistent with the best interests of the animal.

Several limitations should be considered when interpreting these findings. First, the study was based exclusively on publicly available secondary data, official reports, and published scientific literature rather than primary epidemiological or clinical data. Second, the scenario-based assessment represents an evidence-informed conceptual framework rather than a predictive economic model and therefore should not be interpreted as forecasting future insurance uptake or clinical outcomes.

Despite these limitations, the study provides a useful conceptual foundation for future research. Nationwide studies based on primary data collected from companion animal veterinarians are needed to quantify the prevalence of economic euthanasia and dysthanasia, identify the financial, clinical, and ethical factors influencing end-of-life decision-making, and evaluate the contribution of pet health insurance to veterinary healthcare accessibility, animal welfare, and evidence-based policy development in Türkiye.

Conclusion

This study provides a scenario-based animal health economics evaluation of the relationships among pet health insurance, economic euthanasia, dysthanasia, and animal welfare in companion animal healthcare in Türkiye. The findings suggest that broader pet health insurance coverage may improve veterinary healthcare accessibility and reduce economically motivated treatment refusal. However, improving financial accessibility alone is insufficient to ensure appropriate clinical outcomes. Welfare-oriented clinical decision-making, quality-of-life assessment, and evidence-based ethical practice may play an important role in minimizing

the potential risk of dysthanasia. Economic euthanasia and dysthanasia may be regarded as complementary challenges rather than independent phenomena within companion animal healthcare. Because empirical evidence from Türkiye remains limited, future nationwide studies based on primary data are needed to quantify their prevalence, identify the factors influencing veterinary decision-making, and evaluate the contribution of pet health insurance to animal welfare, veterinary healthcare accessibility, and evidence-based policy development.

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Author contribution statement

BŞ: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Visualization. SY: Conceptualization, Methodology, Supervision, Validation, Writing – review and editing, Interpretation of results, Project administration, Correspondence.

Conflict of interest

The authors declare that they have no conflict of interest.

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