



OPTIMIZING HEALTH SERVICE MANAGEMENT IN UMRAH TOUR OPERATORS: A RETROSPECTIVE ANALYSIS

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Abstract: Private Umrah tour operators (PPIU) rarely utilize morbidity data for health service management. This retrospective descriptive study analyzes 783 medical consultations from a PPIU between October 2024 and February 2025 to optimize health logistics and operational strategies. The analysis reveals that morbidity is dominated by acute respiratory infections (38.4%) and musculoskeletal disorders (28.1%), followed by hypertension/cardiovascular issues (10.2%), gastrointestinal disorders (8.5%), and dermatitis (5.8%). A distinct seasonal peak occurred during the winter months (December–January). Furthermore, elderly pilgrims (>60 years) demonstrated a significantly higher risk of fatigue-induced hypertension. These findings emphasize that Umrah health needs are highly predictable. The study concludes that PPIUs must shift from reactive care to proactive, data-driven health logistics. This involves integrating internal morbidity surveillance into pharmaceutical forecasting, adjusting medical supplies seasonally, and implementing targeted preventive programs for high-risk groups. Training tour leaders to manage pilgrim fatigue is identified as a critical operational strategy to enhance logistical efficiency, pilgrim safety, and service competitiveness.

Keywords: Mass Gathering Medicine, Pilgrim Health, Umrah, Health Service Management.

Abstrak: : Penyelenggara Perjalanan Ibadah Umrah (PPIU) jarang menggunakan data morbiditas dalam manajemen layanan kesehatan. Studi deskriptif retrospektif ini menganalisis 783 konsultasi medis dari sebuah PPIU antara Oktober 2024 dan Februari 2025 untuk mengoptimalkan logistik kesehatan dan strategi operasional. Hasil analisis menunjukkan bahwa morbiditas didominasi oleh infeksi saluran pernapasan akut (38,4%) dan gangguan muskuloskeletal (28,1%), diikuti oleh masalah hipertensi/kardiovaskular (10,2%), gangguan pencernaan (8,5%), dan dermatitis (5,8%). Lonjakan kasus yang signifikan terjadi selama bulan-bulan musim dingin (Desember–Januari). Selain itu, jamaah lansia (>60 tahun) menunjukkan risiko hipertensi akibat kelelahan yang jauh lebih tinggi. Temuan ini menegaskan bahwa kebutuhan kesehatan umrah sangat dapat diprediksi. Studi ini menyimpulkan bahwa PPIU harus beralih dari penanganan reaktif menuju logistik kesehatan proaktif berbasis data. Hal ini mencakup integrasi pengawasan morbiditas internal

ke dalam peramalan kebutuhan pasokan farmasi, penyesuaian medis musiman, dan pelaksanaan program preventif kebusus untuk kelompok berisiko tinggi. Pelatihan pemimpin tur untuk mengelola kelelahan jamaah diidentifikasi sebagai strategi operasional penting untuk meningkatkan efisiensi logistik, keselamatan jamaah, dan daya saing layanan.

Kata Kunci: Mass Gathering Medicine; Pilgrim Health; Logistik Kesehatan; Umrah; Manajemen Layanan.

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Introduction

Private Umrah tour operators (PPIU) have evolved into complex service organizations that manage marketing, travel logistics and customer service for pilgrims across the entire Umrah journey.¹ Contemporary studies in Hajj and Umrah management show that systematic planning, implementation, and control are critical for achieving high levels of pilgrim satisfaction.² However, within this management architecture, health services such as pre-travel screening and medical support are often treated as peripheral compliance activities rather than as a strategically managed logistics subsystem.

Mass-gathering medicine (MGM) indicates that Islamic pilgrimages are associated with substantial burdens of respiratory infections, gastrointestinal illness, and acute exacerbations of chronic diseases.³ Older adults and those with pre-existing conditions like hypertension or diabetes are at a heightened risk of severe outcomes.⁴ While Saudi Arabia has invested in macro-level surveillance and digital platforms,⁵ the linkage between these national health systems and the micro-level operations of private operators (PPIU) remains underdeveloped.

¹ K Anesta dan J Kenedi, “Manajemen Pelayanan dalam Meningkatkan Minat Calon Jama’ah Haji dan Umroh pada PT. Tour and Travel Auliya Perkasa Abadi di Pasaman Barat,” *Multazam: Jurnal Manajemen Haji dan Umrah*, 2023, <https://doi.org/10.32332/multazam.v3i2.7470>; P Kolivand et al., “Hospitalization, Mortality, and Health Service Delivery Pattern Among Iranian Hajj Pilgrims by Age, Sex, and Province in 2013–22,” *Frontiers in Public Health* 13 (2025), <https://doi.org/10.3389/fpubh.2025.1451591>.

² A Aljohani et al., “E-government and Logistical Health Services During Hajj Season,” *Bulletin of the National Research Centre* 46 (2022), <https://doi.org/10.1186/s42269-022-00801-4>; O Mahomed, M Jaffer, dan S Parker, “Morbidity Amongst South African Hajj Pilgrims in 2023: A Retrospective Cohort Study,” *Scientific Reports* 14 (2024), <https://doi.org/10.1038/s41598-024-62682-z>.

³ M Aziz, H El-Megeed, dan M Ellatif, “Pre-travel Health Seeking Practices of Umrah Pilgrims Departing from Assiut International Airport, Egypt,” *Travel Medicine and Infectious Disease* 23 (2018): 72–76, <https://doi.org/10.1016/j.tmaid.2018.04.012>; A Fadilah dan D Solahudin, “The Impact of Service Quality and Trust on Umrah Pilgrim Satisfaction at PT. Adhya Tour and Travel Bandung in 2024,” *Mabrur: Academic Journal of Hajj and Umra*, 2025, <https://doi.org/10.15575/mjhu.v4i1.40403>; K Salem, “Accelerating Digital Transformation in Umrah: The Role of AI in Building a Safer and More Connected Pilgrim Journey,” *International Journal of Scientific Research in Science and Technology*, 2025, <https://doi.org/10.32628/ijrst25126301>.

⁴ M Amerzadeh dan S Tabatabaee, “A Qualitative Study on Operational Challenges of Iranian Affiliated Mobile Health Clinics in Iraq During Arbaeen,” *Scientific Reports* 15 (2025), <https://doi.org/10.1038/s41598-025-22820-7>; I Khan et al., “Morbidity and Mortality Amongst Indian Hajj Pilgrims: A 3-year Experience of Indian Hajj Medical Mission in Mass-Gathering Medicine,” *Journal of Infection and Public Health* 11 (2017): 165–70, <https://doi.org/10.1016/j.jiph.2017.06.004>.

⁵ S Sayudin, A Yusup, dan R Ferdiansah, “Management Analysis of Hajj and Umrah Travel Services PT. JGroup Amanah Wisata,” *American Journal of Economic and Management Business*, 2023, <https://doi.org/10.58631/ajemb.v2i2.21>.

This study fills a critical gap in the literature by positioning health service management as a strategic pillar within the operational core of Umrah travel. Effective health logistics, which include the procurement and distribution of medical supplies, are crucial for avoiding compromised care quality.⁶ This research addresses the fragmented nature of previous studies by explicitly integrating three frameworks: Mass Gathering Medicine (MGM), Supply Chain Management (SCM), and Service Management.

By utilizing a retrospective descriptive analysis of 783 medical consultations from a PPIU between October 2024 and February 2025, this study pursues three objectives: (1) To describe the morbidity profile of Umrah pilgrims to improve methodological transparency regarding health, (2) To identify seasonal and demographic patterns with direct implications for predictive health logistics and risk management, and (3) To translate these patterns into concrete managerial strategies, explicitly demonstrating how private operators can shift from reactive responses to data-driven, predictive management

Through this approach, the article demonstrates how private Umrah tour operators can evolve into data-driven health service managers aligned with broader national health system goals.

Theoretical Approach

This research is grounded in a multidisciplinary framework that synthesizes medical science, supply chain management, and service operations. Rather than treating these fields as isolated silos, this study integrates them into a cohesive "Predictive Health Logistics" model, where clinical data directly informs operational decision-making in the private Umrah sector.

Mass Gathering Medicine (MGM) and Epidemiological Predictability

The foundational concept of this study relies on the principles of Mass Gathering Medicine (MGM). MGM postulates that the concentration of large populations in specific geographic areas significantly alters baseline health risks.⁷ In the Umrah context, variables such as extreme crowding and global convergence create predictable epidemiological curves. This study operationalizes "Seasonal Patterns" within the MGM framework, defining them as periodic climatic transitions in Saudi Arabia that dictate the surge of specific communicable diseases, particularly Acute Respiratory Infections (ARI).

The Fatigue-Illness Paradigm and Clinical Variables

To understand the causality of morbidity, this study utilizes the Fatigue-Illness Paradigm. Prolonged physical exertion during rituals (*Tawaf and Sa'i*), combined with sleep deprivation, acts as a physiological stressor that suppresses the immune response.⁸

⁶ M Gaddoury dan H Armenian, "Epidemiology of Hajj Pilgrimage Mortality: Analysis for Potential Intervention," *Journal of Infection and Public Health*, 2023, <https://doi.org/10.1016/j.jiph.2023.05.021>.

⁷ S Parker et al., "Sacred Journeys and Pilgrimages: Health Risks Associated with Travels for Religious Purposes," *Journal of Travel Medicine* 31 (2024), <https://doi.org/10.1093/jtm/taae122>; Khan et al., "Morbidity and Mortality Amongst Indian Hajj Pilgrims: A 3-year Experience of Indian Hajj Medical Mission in Mass-Gathering Medicine".

⁸ Parker et al., "Sacred Journeys and Pilgrimages: Health Risks Associated with Travels for Religious Purposes."

1. Variable Operationalization: "Fatigue-related conditions" are defined as acute musculoskeletal strain (myalgia) and the physiological stress that triggers exacerbations of non-communicable diseases (NCDs).
2. Demographic Vulnerability: In geriatric populations, this exhaustion is a primary trigger for cardiovascular events and uncontrolled hypertension,⁹ necessitating a differentiated management strategy for elderly cohorts.

Predictive Health Logistics and Supply Chain Management (SCM)

This study shifts the operational focus from a reactive model to Predictive Health Logistics within the scope of Supply Chain Management (SCM). While traditional models utilize static medical kits, Predictive SCM argues that inventory management must be driven by demand forecasting in this case, historical morbidity data. By treating clinical patterns as "logistical demand," Private Umrah Tour Operators (PPIU) can implement a Just-in-Time (JIT) medical supply model. This ensures that the procurement of analgesics, antitussives, or antihypertensives is dynamically adjusted to the specific risk profile and seasonal timing of each departing group.

Integrated Service Management in Umrah Operations

Finally, this study applies Service Management Theory to frame health interventions as a core component of service quality. In the PPIU ecosystem, a pilgrim's well-being is intrinsically linked to their spiritual satisfaction and the operator's perceived reliability. The integration of MGM and SCM into the PPIU's operational core is theorized not merely as medical support, but as a strategic risk-mitigation tool. This integrated approach ensures that data-driven health management enhances the overall value proposition of the Umrah service, aligning micro-level operator actions with broader public health goals.

Research Methods

Study Design and Setting

This research employs a retrospective descriptive design to analyze secondary morbidity data from a single private Umrah tour operator (PPIU). The study was conducted between October 2024 and February 2025, covering multiple group departures. Healthcare services were delivered through hotel-based clinics and mobile medical units integrated into the PPIU's operational structure. This design was chosen to provide an operational management analysis of how observational data can support health logistics, rather than investigating clinical etiology.

Operational Definition of Variables

To ensure methodological transparency and conceptual consistency, key variables are operationalized as follows:

1. Morbidity Categories: Clinical encounters are classified into five groups based on the ICD-10 framework relevant to mass gatherings: acute respiratory infections (ARI),

⁹ Khan et al., "Morbidity and Mortality Amongst Indian Hajj Pilgrims: A 3-year Experience of Indian Hajj Medical Mission in Mass-Gathering Medicine."

musculoskeletal disorders (myalgia/strain), hypertension or cardiovascular issues, gastrointestinal disorders, and dermatitis.

2. Fatigue-Related Conditions: Defined as physical exhaustion or musculoskeletal strain documented by clinicians as being exacerbated by ritual activities (e.g., *Tawaf* and *Sa'i*).
3. Seasonal Patterns: Defined by the monthly climatic transitions in Saudi Arabia, categorized into the "peak winter period" (December–January) and "transition periods" (October–November and February).

Data Source and Sample

The dataset comprises 783 de-identified medical consultation records. Data were extracted from the PPIU's internal health management system. While the use of a single-operator dataset limits broad generalizability, it provides high-granularity insights into the specific logistical challenges faced by private providers a perspective often missing in macro-level Hajj studies.

Data Analysis and Software

Descriptive statistics (frequencies and percentages) were utilized to map morbidity distribution, seasonal peaks, and age-stratified patterns. Analysis was performed using SPSS 22th Version. The decision to utilize descriptive analysis rather than inferential methods was strategic: the primary goal is to generate interpretable patterns for immediate resource allocation and logistical "demand forecasting" within the PPIU. This approach aligns with the "Predictive Planning" framework, which prioritizes operational readiness over hypothesis testing.

Methodological Rigor and Limitations

To ensure data validity, records were cross-checked for consistency in diagnostic labeling. However, several limitations are acknowledged:

1. Clinical Recording Bias: As secondary data, the quality depends on the initial documentation by on-field personnel; minor symptoms may be under-reported.
2. Generalizability: Findings reflect the demographic and operational characteristics of one PPIU and may vary based on different hotel locations or pilgrim socio-economic backgrounds.
3. Secondary Data Constraints: The lack of long-term follow-up limits the analysis to acute encounters during the journey.

Ethical Considerations

This study used de-identified operational data originally collected for service provision and internal quality improvement. Personal identifiers were removed prior to analysis to ensure pilgrim confidentiality, adhering to ethical standards for the secondary use of administrative data in health management research.

Result and Discussion

Result

Morbidity Distribution

Among the 783 medical consultations analyzed, the distribution of primary

morbidity was dominated by respiratory and musculoskeletal conditions. The quantitative breakdown is presented in Table 1.

Table 1. Distribution of Primary Morbidity Categories (n=783)

Morbidity Category	Frequency (n)	Percentage (%)
Acute Respiratory Infection (ARI)	301	38.4%
Musculoskeletal Disorders (Myalgia/Strain)	220	28.1%
Hypertension & Cardiovascular Issues	80	10.2%
Gastrointestinal Disorders	67	8.5%
Dermatitis & Allergy	45	5.8%
Others	70	9.0%

Temporal and Seasonal Peaks

Consultation volumes demonstrated a distinct temporal surge during the winter months of December and January. This seasonal peak was primarily driven by a 25% increase in ARI cases compared to the transition months (October and February).

Demographic Risk and Fatigue

Age-stratified analysis revealed that pilgrims over 60 years accounted for 72% of all hypertension and cardiovascular-related consultations. Clinical documentation specifically linked 65% of these hypertensive episodes to "physical overexertion" during rituals (*Tawaf* and *Sa'i*) and suboptimal recovery periods.

Discussion

Contextualizing Morbidity within Mass Gathering Medicine (MGM)

The observed dominance of ARI (38.4%) and musculoskeletal disorders (28.1%) aligns with established mass gathering health profiles.¹⁰ The predictability of these patterns suggests that health needs in private operations are not idiosyncratic but reflect global trends. The marked winter peak in ARI cases further validates the influence of climatic transitions on pathogen transmission, reinforcing the need for season-specific operational readiness.¹¹

Fatigue-Illness Paradigm and Operational Risks

The correlation between advanced age and fatigue-induced hypertension (10.2% of total cases) underscores the "Fatigue-Illness Paradigm." In the PPIU context, ritual-induced physical exhaustion acts as a primary stressor that triggers exacerbations of non-

¹⁰ Aziz, El-Megeed, dan Ellatif, "Pre-travel Health Seeking Practices of Umrah Pilgrims Departing from Assiut International Airport, Egypt."; Salem, "Accelerating Digital Transformation in Umrah: The Role of AI in Building a Safer and More Connected Pilgrim Journey."

¹¹ Sayudin, Yusup, dan Ferdiansah, "Management Analysis of Hajj and Umrah Travel Services PT. JGroup Amanah Wisata."

communicable diseases (NCDs).¹² This finding directly challenges the reactive "one-size-fits-all" medical approach, suggesting instead that geriatric pilgrims require targeted monitoring and itinerary pacing to mitigate cardiovascular risks.

Predictive Health Logistics and Managerial Strategies

The empirical findings allow for a transition toward Predictive Planning in health logistics. This study identifies three specific managerial implications for PPIUs:

1. **Demand Forecasting:** By calculating medication use per 100 pilgrims based on this morbidity data, PPIUs can optimize inventory levels increasing respiratory-related supplies for winter departures and anti-hypertensives for cohorts with a high proportion of elderly pilgrims.¹³
2. **Human Resource Empowerment:** Frontline actors (*Tour Leaders/Muthawif*) should be trained to recognize early warning signs of exhaustion and respiratory distress, acting as the first line of an integrated surveillance system.¹⁴
3. **Service Quality as Competitive Advantage:** Integrating health risk management such as scheduled hotel-based vital sign checks transforms medical support from a compliance burden into a differentiating service capability that enhances pilgrim trust and satisfaction.¹⁵

Scope and Limitations

While this study provides granular insights into the micro-level health management of Umrah, the use of a single-operator dataset limits broad generalizability. Additionally, potential recording bias in secondary data may under-represent minor symptoms. However, the close alignment between this dataset and macro-level Hajj literature demonstrates the validity of using internal surveillance to guide private-sector health strategies.

Conclusion

This retrospective analysis of 783 medical consultations demonstrates that pilgrim morbidity in private Umrah operations is dominated by acute respiratory infections (38.4%) and musculoskeletal disorders (28.1%). The findings reveal a predictable health demand profile characterized by a significant winter peak and a high prevalence of fatigue-induced hypertension among elderly pilgrims. These patterns align with global mass-gathering medicine trends, suggesting that health risks in the private sector are measurable and manageable.

By integrating these findings into health logistics and service management frameworks, this study provides a roadmap for PPIUs to transition from reactive care to

¹² Khan et al., "Morbidity and Mortality Amongst Indian Hajj Pilgrims: A 3-year Experience of Indian Hajj Medical Mission in Mass-Gathering Medicine."

¹³ Gaddoury dan Armenian, "Epidemiology of Hajj Pilgrimage Mortality: Analysis for Potential Intervention."

¹⁴ Parker et al., "Sacred Journeys and Pilgrimages: Health Risks Associated with Travels for Religious Purposes."

¹⁵ Kolivand et al., "Hospitalization, Mortality, and Health Service Delivery Pattern Among Iranian Hajj Pilgrims by Age, Sex, and Province in 2013--22."

data-driven Predictive Planning. Implementing seasonal supply adjustments, targeted personnel training, and proactive monitoring for high-risk cohorts can significantly enhance logistical efficiency and service quality. Furthermore, aligning operator-level surveillance with national health policies strengthens the overall Hajj–Umrah health ecosystem.

Limitations and Future Research While providing actionable insights, this study is limited by its reliance on a secondary dataset from a single operator, which may affect the generalizability of the results. Future research should utilize multi-operator data and employ inferential statistical models to further validate the relationship between operational variables and health outcomes. Ultimately, embedding morbidity analytics into routine management cycles represents a critical step toward more resilient, informed, and pilgrim-centered Umrah operations.

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