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Communicable Disease Prevention through Health Quarantine Law: An Implementation Study at Surabaya Hajj Debarkation 2026

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ABSTRACT

Despite growing research on Hajj health, no study has systematically examined the relationship between Indonesia's post-2023 health quarantine legal framework and its implementation during Hajj debarkation. The Hajj as an international mass gathering presents cross-border infectious diseases transmission risks, making debarkation a strategic point for health quarantine implementation. This study analyses the implementation of health quarantine law in preventing infectious diseases at Surabaya Hajj Debarkation 1447 H/2026 M and assesses the congruence between legal norms and operational practice. The research employs a doctrinal/normative legal design with implementation analysis based on secondary data from legislation, technical policies, International Health Regulations, scientific literature, and the 2026 Surabaya Hajj Health Report. Analysis was conducted through normative obligations and implementation evidence. Results demonstrate that surveillance of conveyances and pilgrims, screening, laboratory examination, evacuation, referral, and notification have documented evidence aligned with health quarantine obligations. However, gaps remain in health declaration completeness, data quality and consistency, system interoperability, manual data processing, and limited post-return follow-up evidence. Strengthening implementation requires integrating detection-notification-response chain, data standardization, closed-loop follow-up, digital literacy, and periodic regulatory audits.

Keywords: Communicable Disease, Hajj Pilgrims, Health Quarantine, Legal Implementation, Point of Entry

INTRODUCTION

The Hajj pilgrimage represents one of the most significant international mass gatherings, annually bringing millions of pilgrims from diverse geographical backgrounds into concentrated spaces and timeframes, accompanied by international air mobility, crowded accommodations and transportation, intensive human contact, and varied age and health conditions.¹ These characteristics form an epidemiological environment conducive to disease transmission, particularly respiratory infections, without excluding other communicable diseases and the risk of antimicrobial-resistant microorganism spread.² The health risks associated with Hajj do not conclude when the rituals end; the return phase connects exposures during the pilgrimage with international transport networks and communities in pilgrims' countries of origin.³ Consequently, pilgrim health directly intersects with global health security concerns, especially during the return phase when health risks move from the mass gathering arena toward the pilgrims' home countries.

Within this context, health quarantine at points of entry constitutes an integral part of the public health protection system. Its function extends beyond merely screening travelers upon arrival to encompass a continuum of activities: early detection, surveillance, risk assessment, examination of persons and conveyances, diagnostic support, notification, referral, risk communication, and response coordination.⁴ The International Health Regulations (IHR) mandate States Parties to develop and maintain core capacities to detect, assess, report, and respond to public health risks, including capacities at designated points of entry, and to connect these functions with national surveillance and response systems.⁵ The amended IHR (2005) as amended in 2014, 2022, and 2024, with the 2024 amendments generally taking effect on 19 September 2025, was already effective prior to the Surabaya Debarkation in June-July 2026.

¹ Salim Parker et al., "Sacred Journeys and Pilgrimages: Health Risks Associated with Travels for Religious Purposes," *Journal of Travel Medicine* 31, no. 8 (December 10, 2024), <https://doi.org/10.1093/jtm/taae122>.

² Hashim A. Mahdi et al., "Epidemiological Differences in Hajj-Acquired Airborne Infections in Pilgrims Arriving from Low and Middle-Income versus High-Income Countries: A Systematised Review," *Tropical Medicine and Infectious Disease*, 2023, <https://doi.org/10.3390/tropicalmed8080418>.

³ Thibault Lovey et al., "Travel-Related Respiratory Symptoms and Infections in Travellers (2000–22): A Systematic Review and Meta-Analysis," *Journal of Travel Medicine* 30, no. 5 (September 5, 2023), <https://doi.org/10.1093/jtm/taad081>.

⁴ Varvara A. Mouchtouri, Eleni P. Christoforidou, Maria An der Heiden, et al., "Exit and Entry Screening Practices for Infectious Diseases among Travelers at Points of Entry: Looking for Evidence on Public Health Impact," *International Journal of Environmental Research and Public Health*, 2019, <https://doi.org/10.3390/ijerph16234638>.

⁵ "World Health Organization. (2025). International Health Regulations (2005), as Amended in 2014, 2022 and 2024.," 2025, https://www.who.int/health-topics/international-health-regulations#tab=tab_1.

At the national level, Indonesia's health quarantine legal framework underwent fundamental transformation following the enactment of Law Number 17 of 2023 concerning Health. This law explicitly revoked Law Number 6 of 2018 concerning Health Quarantine, rendering the latter inapplicable as the primary positive law for assessing health quarantine implementation in 2026.⁶ The post-2023 normative architecture is further elaborated through Government Regulation Number 28 of 2024 concerning Implementing Regulations of Law Number 17 of 2023 concerning Health, which establishes a broader implementation framework for health governance.⁷ By 2026, this regulatory layer also encompasses Presidential Regulation Number 13 of 2026 concerning Health Management, Minister of Health Regulation Number 1 of 2026 concerning Extraordinary Events, Outbreaks, and Health Crises, and Minister of Health Regulation Number 3 of 2026 concerning Disease Control, all of which are in effect according to the Ministry of Health's official legal database.⁸ The transition from a specific quarantine law regime toward integrated regulation within the broader health law framework creates a need to examine how norms concerning port surveillance, surveillance, disease control, information exchange, and health response are translated by implementing institutions.⁹

The empirical context of the Surabaya Hajj Debarkation 1447 H/2026 M reveals an operational scale relevant for such examination. The BBKK (Center for Health Quarantine) Surabaya report recorded surveillance of 116 Hajj aircraft and the arrival of 43,895 pilgrims through Juanda International Airport; temperature screening subsequently identified 72 pilgrims with temperature $\geq 37.5^{\circ}$ C, while 102 pilgrims fell into groups undergoing symptom examination or further investigation. Among those examined laboratorially, the detailed report recorded five positive SARS-CoV-2 samples, 29 positive Influenza A samples, nine positive Influenza B samples, and eight MERS-CoV samples with negative results. The

⁶ “Undang-Undang (UU) Nomor 17 Tahun 2023 Tentang Kesehatan,” Pub. L. No. 17 (2023), <https://peraturan.bpk.go.id/Details/258028/uu-no-17-tahun-2023>.

⁷ “Peraturan Pemerintah (PP) Nomor 28 Tahun 2024 Tentang Peraturan Pelaksanaan Undang-Undang Nomor 17 Tahun 2023 Tentang Kesehatan,” Pub. L. No. 28 (2024), <https://peraturan.bpk.go.id/Details/294077/pp-no->.

⁸ Peraturan Pemerintah (PP) Nomor 28 Tahun 2024 tentang Peraturan Pelaksanaan Undang-Undang Nomor 17 Tahun 2023 tentang Kesehatan; “Peraturan Menteri Kesehatan Nomor 3 Tahun 2026 Tentang Penanggulangan Penyakit” (2026), <https://jdih.kemkes.go.id/documents/peraturan-menteri-kesehatan-nomor-3-tahun-2026>; “Peraturan Menteri Kesehatan Nomor 8 Tahun 2026 Tentang Perubahan Atas Peraturan Menteri Kesehatan Nomor 10 Tahun 2023 Tentang Organisasi Dan Tata Kerja Unit Pelaksana Teknis Bidang Kekarantinaan Kesehatan,” Pub. L. No. 8 (2026), <https://jdih.kemkes.go.id/documents/peraturan-menteri-kesehatan-nomor-8-tahun-2026>.

⁹ AD Moulton and RN Gottfried, “What Is Public Health Legal Preparedness,” *Journal of Law, Medicine & Ethics* 31 (2003): 672–683.

same report noted that 35,879 pilgrims, or approximately 81.74%, completed the SSHP (All Indonesia Health Declaration), while 8,016 pilgrims did not.¹⁰

Although Hajj health has become a growing field of research, literature review indicates that scholarly focus remains predominantly on disease epidemiology, respiratory infections, vaccination, morbidity characteristics, surveillance, and health services, rather than on evaluating the relationship between health quarantine legal norms and their implementation during the debarkation phase.¹¹ In the Indonesian context, for instance, previous studies have assessed MERS-CoV screening among tens of thousands of returning Indonesian Hajj pilgrims, developed Umrah pilgrim health surveillance systems at Port Health Office Class I Surabaya, and examined Hajj health personnel experiences and factors associated with pilgrims' health preparedness. In other country contexts, post-Hajj pilgrim research has similarly remained predominantly oriented toward epidemiological detection and characterization of diseases.¹² A study on law enforcement against health protocol violators in Indonesia demonstrates the importance of legal frameworks in supporting disease prevention, including temperature screening protocols and travel restrictions, which align with the health quarantine functions examined in this research.¹³ Additionally, research on the enforcement of criminal sanctions under health quarantine law highlights the intersection between legal certainty and public health implementation, reinforcing the relevance of examining how normative frameworks translate into operational practice.¹⁴

Based on these identified gaps, the novelty of this research lies in its integration of positive legal analysis following Indonesia's post-2023 health law transformation with critical audit of administrative implementation data, assessing

¹⁰ Balai Besar Kekarantinaan Kesehatan Surabaya, "Laporan Penyelenggaraan Pelayanan Kesehatan Haji Embarkasi-Debakasi Surabaya Tahun 1447 H/2026 M," 2026, <https://bbkk-surabaya.go.id/laporan/>.

¹¹ M. Amin et al., "Screening for Middle East Respiratory Syndrome Coronavirus among Febrile Indonesian Hajj Pilgrims: A Study on 28,197 Returning Pilgrims," *Journal of Infection Prevention* 19, no. 5 (2018), <https://doi.org/10.1177/1757177418765634>; Bangun Cahyo Utomo, Chatarina Umbul Wahjuni, and Windhu Purnomo, "UMRAH HEALTH SURVEILLANCE SYSTEM IN PORT HEALTH OFFICE CLASS I SURABAYA," *Jurnal Berkala Epidemiologi* 7, no. 2 (August 30, 2019): 137, <https://doi.org/10.20473/jbe.V7I22019.137-146>; Sugeng Sugeng et al., "Experiences of Indonesian Nurses as Hajj Health Personnel in Caring for Hajj Pilgrims: A Qualitative Study," *Belitung Nursing Journal* 10, no. 5 (October 15, 2024): 554–62, <https://doi.org/10.33546/bnj.3494>.

¹² Amr Kandeel et al., "Comparative Analysis of COVID-19 and Influenza Prevalence among Egyptian Pilgrims Returning from Hajj and Umrah in 2022: Epidemiology, Clinical Characteristics, and Genomic Sequencing," *Archives of Public Health* 82, no. 1 (2024), <https://doi.org/10.1186/s13690-023-01229-6>.

¹³ Mochammad Muslihuddin and Dr. Yahman Yahman, "LAW ENFORCEMENT AGAINST HEALTH PROTOCOL COVID-19 VIOLATIONS IN INDONESIA," *Journal of Law Theory and Law Enforcement*, August 11, 2022, 44–52, <https://doi.org/10.56943/jlte.v1i3.102>.

¹⁴ M. Sholehuddin and Jonaedi Efendi, "CRIMINAL POLICY IN LAW ENFORCEMENT RELATED TO MALPUBLIC ADMINISTRATION," *Journal of Law Theory and Law Enforcement*, December 28, 2021, 1–7, <https://doi.org/10.56943/jlte.v1i1.6>.

norm-practice gaps interdisciplinarily.¹⁵ The methodological gap is equally significant. While previous studies have focused separately on pathogen identification, system operations, or regulatory requirements, this research integrates these perspectives to examine whether obligations derived from the 2026 legal framework correspond with implementation evidence, which aspects are only partially fulfilled, and which aspects cannot be assessed due to data limitations. This research combines these three approaches with a different question: whether obligations derived from the 2026 legal framework have corresponding implementation evidence in Surabaya Debarkation operations, which aspects are only partially fulfilled, and which aspects cannot yet be assessed due to data limitations.¹⁶ This study aims to map the national and international legal construction governing health quarantine for returning Hajj pilgrims, describe how these provisions were implemented at the Surabaya Hajj Debarkation 1447 H/2026 M, and assess the congruence and gaps between normative obligations and documented evidence of implementation.¹⁷

LITERATURE REVIEW

Health quarantine law serves as the legal foundation for public health measures at international borders, designed to prevent the introduction and spread of communicable diseases across jurisdictions. The International Health Regulations (2005) establish the primary international legal framework requiring States Parties to maintain core capacities at designated points of entry, including access to medical and diagnostic services, trained personnel for conveyance inspection, laboratory linkages, and emergency response capabilities.¹⁸ Within Indonesia's legal system, health quarantine authority has historically been governed by Law Number 6 of 2018 concerning Health Quarantine. However, the enactment of Law Number 17 of 2023 concerning Health fundamentally restructured this framework by revoking the specific quarantine law and integrating quarantine

¹⁵ Guilherme Queiroz et al., "Assessment of the Implementation of the International Health Regulations during the COVID-19 Pandemic: Portugal as a Case Study," *Acta Médica Portuguesa* 36, no. 12 (October 11, 2023): 819–25, <https://doi.org/10.20344/amp.19887>.

¹⁶ Remidius Kamuhabwa Kakulu, Esther Gwae Kimaro, and Emmanuel Abraham Mpolya, "Effectiveness of Point of Entry Health Screening Measures among Travelers in the Detection and Containment of the International Spread of COVID-19: A Review of the Evidence," *International Journal of Environmental Research and Public Health*, 2024, <https://doi.org/10.3390/ijerph21040410>.

¹⁷ Noha Maddah et al., "Effectiveness of Public Health Digital Surveillance Systems for Infectious Disease Prevention and Control at Mass Gatherings: Systematic Review," *Journal of Medical Internet Research* 25 (May 19, 2023): e44649, <https://doi.org/10.2196/44649>.

¹⁸ Samir Refaey et al., "Cross-Sectional Survey and Surveillance for Influenza Viruses and MERS-CoV among Egyptian Pilgrims Returning from Hajj during 2012-2015," *Influenza and Other Respiratory Viruses* 11, no. 1 (2017), <https://doi.org/10.1111/irv.12429>; Xuezheng Ma et al., "No MERS-CoV but Positive Influenza Viruses in Returning Hajj Pilgrims, China, 2013–2015," *BMC Infectious Diseases* 17, no. 1 (December 10, 2017): 715, <https://doi.org/10.1186/s12879-017-2791-0>.

functions within the broader health law regime.¹⁹ This transformation necessitates re-examination of how existing operational procedures align with the new normative architecture, particularly regarding disease surveillance, laboratory confirmation, notification mechanisms, and inter-agency coordination at points of entry.²⁰

The Hajj pilgrimage represents a distinctive context for health quarantine implementation due to its scale, international composition, and epidemiological characteristics. Millions of pilgrims from diverse geographical origins converge in Saudi Arabia, participate in intensive ritual activities, share communal accommodations and transportation, and return to their home countries within a compressed timeframe.²¹ Systematic reviews have consistently identified respiratory infections as the most significant communicable disease concern during and after Hajj, with influenza viruses, rhinoviruses, and other respiratory pathogens frequently detected among returning pilgrims.²² Studies conducted across multiple countries have documented the presence of influenza viruses among returning Hajj pilgrims while often failing to detect MERS-CoV in examined samples. This pattern suggests that surveillance systems may be over-focused on a single pathogen (MERS-CoV) while neglecting more commonly detected respiratory viruses.²³ Research on Indonesian pilgrims has similarly identified influenza A/H3N2 circulation while MERS-CoV remained undetected.²⁴ The COVID-19 pandemic expanded the spectrum of concerns, with post-pandemic studies showing both SARS-CoV-2 and influenza detectable among returning pilgrims.²⁵ These findings emphasize that respiratory disease surveillance during Hajj should not focus exclusively on a single pathogen but must maintain capacity to detect multiple etiologies.²⁶

Existing literature has predominantly focused on epidemiological aspects of Hajj health, including disease prevalence, vaccination coverage, and morbidity

¹⁹ Agustiniingsih Agustiniingsih et al., “Molecular Characterization of Influenza A/H3N2 Virus Isolated from Indonesian Hajj and Umrah Pilgrims 2013 to 2014,” *Life* 13, no. 5 (2023), <https://doi.org/10.3390/life13051100>.

²⁰ Sherif A. El-Kafrawy et al., “Genetic Diversity and Molecular Analysis of Human Influenza Virus among Pilgrims during Hajj,” *Heliyon* 10, no. 1 (January 2024): e23027, <https://doi.org/10.1016/j.heliyon.2023.e23027>.

²¹ Parker et al., “Sacred Journeys and Pilgrimages: Health Risks Associated with Travels for Religious Purposes.”

²² Lovey et al., “Travel-Related Respiratory Symptoms and Infections in Travellers (2000–22): A Systematic Review and Meta-Analysis.”

²³ Refaey et al., “Cross-Sectional Survey and Surveillance for Influenza Viruses and MERS-CoV among Egyptian Pilgrims Returning from Hajj during 2012-2015.”

²⁴ Agustiniingsih et al., “Molecular Characterization of Influenza A/H3N2 Virus Isolated from Indonesian Hajj and Umrah Pilgrims 2013 to 2014.”

²⁵ Kandeel et al., “Comparative Analysis of COVID-19 and Influenza Prevalence among Egyptian Pilgrims Returning from Hajj and Umrah in 2022: Epidemiology, Clinical Characteristics, and Genomic Sequencing.”

²⁶ El-Kafrawy et al., “Genetic Diversity and Molecular Analysis of Human Influenza Virus among Pilgrims during Hajj.”

patterns, rather than on evaluating the relationship between health quarantine legal norms and implementation during the debarkation phase.²⁷ Studies on surveillance systems have emphasized system components and reporting mechanisms, while normative legal studies have tended to describe legal frameworks without systematic examination of how legal obligations translate into operational practice.²⁸ This study contributes to the literature by examining the relationship between health quarantine legal norms and documented implementation at the Surabaya Hajj Debarkation, employing an interdisciplinary approach that integrates legal analysis with administrative data audit. The study addresses the gap between law in books and law in action by assessing whether obligations derived from the applicable legal framework have corresponding implementation evidence, which aspects are partially fulfilled, and which aspects cannot be assessed due to documentation limitations.²⁹

RESEARCH METHODOLOGY

This study employs a mixed-methods legal research approach, combining doctrinal analysis of legal norms with document-based implementation analysis, using the Surabaya Hajj Debarkation 1447 H/2026 M as a case study. This design connects two layers of analysis: law in books as the normative standard and law in action as reflected in implementation documents. Three approaches are integrated: the statute approach to identify and interpret applicable legislation and technical policies; the conceptual approach to operationalize health quarantine, point-of-entry surveillance, and detection-notification-response capacity within the IHR framework; and the document-based implementation approach to compare normative obligations with recorded activities.³⁰

Primary legal materials include legislation, implementing regulations, technical health and quarantine policies, Hajj organization regulations for 2026, and the International Health Regulations effective during the research period. Legal sources were traced through official repositories including the Ministry's JDIH, the State Secretariat JDIH, the Peraturan BPK database, and official WHO documents. The primary administrative data source is the 2026 Surabaya Embarkation-Debarkation Hajj Health Services Report compiled by BBKK Surabaya, covering the debarkation period from 1 June to 1 July 2026. This report is treated as a secondary administrative data source because it was compiled for accountability

²⁷ Amin et al., "Screening for Middle East Respiratory Syndrome Coronavirus among Febrile Indonesian Hajj Pilgrims: A Study on 28,197 Returning Pilgrims."

²⁸ Mouchtouri, Christoforidou, der Heiden, et al., "Exit and Entry Screening Practices for Infectious Diseases among Travelers at Points of Entry: Looking for Evidence on Public Health Impact."

²⁹ Maddah et al., "Effectiveness of Public Health Digital Surveillance Systems for Infectious Disease Prevention and Control at Mass Gatherings: Systematic Review."

³⁰ Moulton and Gottfried, "What Is Public Health Legal Preparedness."

rather than research purposes, and may contain recording biases or inconsistencies that affect its reliability.³¹

The unit of analysis is the implementation of health quarantine functions during the Surabaya Hajj Debarkation. Data regarding pilgrims screened, examined, tested, notified, or referred are used as system implementation indicators, not individual clinical diagnoses. Analysis proceeded through identification and positioning of norms according to hierarchy and validity, systematic interpretation of provisions, mapping of responsible parties or institutions, and translation of each norm into operational obligations traceable in the implementation report. Implementation analysis compared normative obligations with documented evidence using the analytical framework below.³²

Table 1 Analytical Framework for Normative-Implementation Assessment

Normative Source	Operational Obligation	Implementation Indicator	Report Evidence	Assessment Level
Legal provision verified	Action required/permitted	Observable output	Page/table/figure in BBKK (Center for Health Quarantine) report	Documented Compliance: Evidence confirms implementat. Partial Compliance: Main action performed but incomplete. Substantive Gap: Evidence of non-compliance. Documentary Gap: Insufficient information.

Source: Author's construction (2026)

Assessment used four categories: documented compliance, partial compliance, substantive gap, and documentary gap/not assessable. Document reliability was maintained through internal and external triangulation, with all discrepancies recorded as source limitations without imputation or correction.³³

³¹ Balai Besar Kekarantinaan Kesehatan Surabaya, "Laporan Penyelenggaraan Pelayanan Kesehatan Haji Embarkasi–Debarkasi Surabaya Tahun 1447 H/2026 M."

³² Mouchtouri, Christoforidou, der Heiden, et al., "Exit and Entry Screening Practices for Infectious Diseases among Travelers at Points of Entry: Looking for Evidence on Public Health Impact."

³³ Queiroz et al., "Assessment of the Implementation of the International Health Regulations during the COVID-19 Pandemic: Portugal as a Case Study."

RESULT AND DISCUSSION

Documented Compliance: Core Functions

The findings reveal that health quarantine implementation at the Surabaya Hajj Debarkation demonstrates a layered pattern of compliance across core functions, with documented evidence for surveillance, screening, laboratory examination, evacuation, and notification, while gaps persist in data quality, system integration, and follow-up documentation. Legally, the debarkation operated under a new regime following the revocation of Law Number 6 of 2018 by Law Number 17 of 2023 and the application of new technical instruments, particularly Minister of Health Regulation Number 1 of 2026 concerning Extraordinary Events, Outbreaks, and Health Crises and Minister of Health Regulation Number 3 of 2026 concerning Disease Control. At the international level, the applicable standard is the International Health Regulations (2005) as amended in 2014, 2022, and 2024, with Annex 1 placing medical and diagnostic services, transport of sick pilgrims, conveyance inspection, response readiness, health facility and laboratory networks, and traveler management as part of core point of entry capacities.

At the most fundamental level, there is documented compliance between several normative obligations and the Surabaya Debarkation practices. Minister of Health Regulation Number 1 of 2026 defines health quarantine officers as personnel authorized to conduct surveillance and control measures against conveyances, persons, goods, and the environment. The BBKK (Center for Health Quarantine) report demonstrates that this function was realized through surveillance of 116 Hajj aircraft, examination of HPAGD (Health Part of Aircraft General Declaration) information, use of TKHK (Special Hajj Health Certificate) data, assessment of pilgrims reported ill, and post-arrival person surveillance. Similar compliance appears in response functions. The regulation requires that when surveillance identifies a person who is ill or shows clinical symptoms and is designated as a suspect, officers conduct medical examination and control measures. The report shows a tiered process from health condition identification, temperature and symptom screening, medical examination, laboratory testing, ambulance evacuation, to hospital referral. A total of 81 evacuations from the airport were recorded, consisting of 14 directly to hospitals and 67 to the Hajj Dormitory, while 65 hospital referrals were recorded for overall debarkation services. These findings correspond with Annex 1 of the IHR, which requires access to medical and diagnostic services, transport means for sick travelers, and arrangements with health facilities and laboratories.

However, correspondence of activities does not equal full compliance with all normative capacities. Annex 1 also demands adequate staff, equipment and space, trained personnel for conveyance inspection, contingency plans, interagency contact points, appropriate space for interviewing suspects, and access to personnel with proper protection. The BBKK report documents some of these elements but

does not always provide indicators regarding capacity adequacy, 24/7 readiness, response time, facility completeness, or contingency plan testing. Given the document-based research design, this gap is more appropriately categorized as documentary evidence gap rather than direct substantive violation. The absence of evidence does not necessarily indicate the absence of implementation; however, the consistency of documentation gaps across multiple indicators suggests systematic weaknesses in the surveillance information system rather than isolated reporting omissions.

Laboratory Findings and Epidemiological Implications

Detection in the health quarantine context serves both legal and epidemiological functions. Legally, Minister of Health Regulation Number 1 of 2026 requires person surveillance through health documents and risk factor examination; if a person is found ill or symptomatic meeting suspect criteria, medical examination and control measures may be undertaken. Operationally, the Surabaya Debarkation used flight information and TKHK, temperature measurement, symptom assessment, and follow-up examination as selection mechanisms. The report recorded 72 pilgrims with temperature $\geq 37.5^{\circ}$ C and 102 pilgrims in the symptomatic/further examination group. From this examined group, antigen and molecular testing for respiratory diseases was then conducted.

Table 2 Laboratory Examination Results for Infectious Diseases

Examination	Samples Tested	Positive	Negative	Notes
RT-Antigen COVID-19	102	0	102	All non-reactive
RT-PCR SARS-CoV-2	102	5	97	4.90% of tested samples
PCR ILI (total)	102	38	64	Influenza A + B
Influenza A	102	29	73	22 A(H1)pdm09, 7 A(H3)
Influenza B	102	9	93	Victoria variant
MERS-CoV	8	0	8	All negative

Source: BBKK (Center For Health Quarantine) Surabaya Report (2026)

This layered design is more defensible than treating temperature screening as the sole defense. International evidence shows that symptom and temperature screening at airports have inherent limitations because travelers may be in the incubation period, have mild or non-specific manifestations, or experience asymptomatic infection. A Cochrane rapid review found considerable variation and low certainty of evidence for the sensitivity of various single screening strategies; temperature or symptom screening cannot be expected to detect all infected

persons. Systematic reviews of entry and exit screening also show that screening benefits are more reasonable when placed alongside diagnostic testing, epidemiological investigation, health communication, contact tracing, and follow-up interventions.³⁴ More recent COVID-19 studies reached similar conclusions that point-of-entry screening performance depends heavily on the methods used and is more appropriate as part of an intervention package than as a standalone measure.³⁵

The laboratory findings from Surabaya support the importance of a layered approach but require careful interpretation. The report states that all 102 COVID-19 antigen tests were non-reactive, while among the 102 samples tested by RT-PCR, there were five positive SARS-CoV-2 results. These aggregate data are insufficient to calculate antigen sensitivity or to state that the five PCR-positive cases were antigen false negatives. The report does not provide individual-level linkage between examinations, timing of sample collection, symptom status, specimen quality, or testing characteristics that would enable such diagnostic evaluation. The defensible conclusion is limited to the fact that, at the program level, molecular testing detected SARS-CoV-2 in the examined pilgrim group even though all reported antigen results in the examination group were non-reactive. This reinforces the function of molecular testing as a verification layer, without enabling comparative accuracy assessment of the two tests. The influenza findings also demonstrate why Hajj respiratory surveillance should not center on a single pathogen. The detailed table records Influenza A and B in examined pilgrim samples, while eight MERS-CoV samples were reported negative. The finding of 29 Influenza A positives among 102 tested samples (28.4%) is comparable to rates found in Egyptian pilgrims (Refaey et al., 2017) and Ghanaian pilgrims (Annan et al., 2015), though differences in sampling strategies and testing methods limit direct comparison.³⁶ Post-Hajj 2021 studies also indicate that even when respiratory symptom events may be lower under certain control conditions, the possibility of transmission to contacts after return remains a public health concern.

³⁴ Varvara A. Mouchtouri, Eleni P. Christoforidou, Maria an der Heiden, et al., “Exit and Entry Screening Practices for Infectious Diseases among Travelers at Points of Entry: Looking for Evidence on Public Health Impact,” *International Journal of Environmental Research and Public Health* 16, no. 23 (November 21, 2019): 4638, <https://doi.org/10.3390/ijerph16234638>.

³⁵ Remidius Kamuhabwa Kakulu, Esther Gwae Kimaro, and Emmanuel Abraham Mpolya, “Effectiveness of Point of Entry Health Screening Measures among Travelers in the Detection and Containment of the International Spread of COVID-19: A Review of the Evidence,” *International Journal of Environmental Research and Public Health* 21, no. 4 (March 28, 2024): 410, <https://doi.org/10.3390/ijerph21040410>.

³⁶ Mohammad Mousa Al-Abdallat et al., “Acute Respiratory Infections among Returning Hajj Pilgrims—Jordan, 2014,” *Journal of Clinical Virology* 89 (2017), <https://doi.org/10.1016/j.jcv.2017.01.010>; Augustina Annan et al., “High Prevalence of Common Respiratory Viruses and No Evidence of Middle East Respiratory Syndrome Coronavirus in Hajj Pilgrims Returning to Ghana, 2013,” *Tropical Medicine and International Health* 20, no. 6 (2015), <https://doi.org/10.1111/tmi.12482>.

Surveillance Continuity and Notification Mechanism

Health quarantine at debarkation loses much of its preventive value if surveillance stops when pilgrims leave the airport. The IHR concept of surveillance encompasses continuous data collection, collation, and analysis as well as timely information dissemination for public health risk assessment and response. In the Surabaya context, 27 notification letters to Provincial Health Offices for forwarding to districts/cities constitute evidence of a mechanism for transferring surveillance responsibility from the point of entry to the pilgrims' regions of origin.

Table 3 Implementation of Surveillance, SSHP (All Indonesia Health Declaration), Notification, and Information Systems

Component	Documented Evidence	Notes
SSHP (All Indonesia Health Declaration)	35,879 of 43,895 pilgrims completed (81.74%)	8,016 did not complete
Notification letters	27 letters issued	Sent to Provincial Health Offices
SIMHAJI	Used for recording various activities	Partial manual processing
SISKOHATKES (Integrated Hajj Health System)	224 outpatient data; 65 referral data; 8 death data	Input after activities completed
SKDR (Early Warning And Response System)	102 COVID-19/ILI suspect findings; 1 MERS-CoV report	Reporting unit not specified
Surveillance outputs	116 cluster infographics; 31 cumulative infographics; 1 final report	

Source: BBKK (Center For Health Quarantine) Surabaya Report (2026)

The report also notes instructions for post-return health monitoring up to 21 days and utilization of multiple systems, including SKDR (Early Warning and Response System), SINKARKES (Health Quarantine Information System), SISKOHATKES (Integrated Hajj Health System), SIMHAJI (Integrated Hajj Management Information System), NAR (Risk Analysis Note), spreadsheets, and other data collection media. Functionally, this mechanism aligns with the concept of continuity of surveillance: findings at the point of entry generate information that can be forwarded to the jurisdiction where health risks must subsequently be monitored. International experience supports the importance of this function. MERS-CoV traveler investigations show that accurate contact information and interjurisdictional communication networks are necessary so travelers can be found and notified quickly.³⁷ Point of entry capacity development in West Africa also

³⁷ Joanna J. Regan et al., "Tracing Airline Travelers for a Public Health Investigation," *Public Health Reports*® 131, no. 4 (2016): 552–59, <https://doi.org/10.1177/0033354916662213>.

demonstrates that strong systems require integration of mobile populations into national surveillance as well as formal cross-regional and cross-sector coordination. In this framework, BBKK's issuance of notifications can be viewed as a necessary element, but not the final indicator of system success. The main limitation is that the report does not provide data on completion of follow-up: how many people were successfully monitored in their regions, how many could not be contacted, how many subsequently developed symptoms, whether there was re-examination, and what the lag time was between notification and follow-up. Therefore, this study can conclude that a surveillance transition mechanism exists, but cannot conclude that the entire notification-receipt-monitoring-response chain has been fully executed.

Digital Health Declaration: Procedural vs Substantive Compliance

The SSHP (Health Pass Certificate) holds an important position because it connects pilgrims' administrative obligations with epidemiological needs for identity, travel history, and health information. Minister of Health Regulation Number 1 of 2026 stipulates that individual health documents must at minimum contain identity, country or region of origin, health history, and travel history for the last 14 days; health history includes information on clinical signs and symptoms. The regulation allows documents to be submitted electronically before arrival and provides a manual pathway when electronic submission is not possible. Completion coverage of 35,879 out of 43,895 pilgrims or 81.74% shows significant participation, but simultaneously leaves 8,016 pilgrims who according to the report did not complete SSHP. This number should not be directly translated as 8,016 individual legal violations. The regulation itself anticipates situations when electronic documents cannot be submitted and permits manual submission. Since the report does not fully show whether all pilgrims who did not complete the electronic form then fulfilled obligations through alternative mechanisms, the defensible finding is a coverage gap in the electronic system and a documentation gap regarding substitute mechanisms, not an automatic conclusion regarding individual legal non-compliance. The report itself records errors in flight numbers and arrival dates, duplicate entries, difficulty understanding questions, BBKK officers' limitations in downloading data, and the need for manual processing. Thus, the 81.74% achievement is an important indicator, but insufficient as a measure of SSHP's epidemiological quality.

These findings are highly consistent with digital public health literature. Digital systems can accelerate data collection and integration, but benefits depend on interoperability, infrastructure harmonization, training, access governance, and solutions for populations without devices or with low digital literacy.³⁸ Development of the digital Passenger Locator Form in Europe also made minimum

³⁸ Io Hong Cheong and Hui Wang, "Applications of Digital Health in Public Health: The China Experience," *Innovations in Digital Health, Diagnostics, and Biomarkers* 2, no. 2022 (2022): 48–50, <https://doi.org/10.36401/iddb-21-05>.

datasets, inter-system data exchange, and interoperability central design components, not merely the existence of electronic forms.³⁹ The characteristics of pilgrims reinforce this implementation challenge. The report associates some incomplete completion with advanced age, lack of mobile phones, limited pilgrim understanding, and dependence on cluster officers, group leaders, or cohort leaders. This shows that formally uniform digital obligations can produce different implementation burdens for different pilgrim groups. Within the law in action framework, system accessibility is therefore not a secondary technical issue, but part of the law's ability to be actually implemented by the target population. Another issue is the validity of self-declaration. Symptoms like cough and runny nose are common after Hajj and not specific to any single pathogen; conversely, infection can occur without reported symptoms. Hajj studies have found broad respiratory symptoms and variation in the relationship between symptoms and virological findings.⁴⁰ Therefore, health declarations are more appropriate as risk stratification instruments and triggers for further examination, rather than as diagnostic tools.

Norms-Practice Gaps: Data Quality and System Integration

Overall, the relationship between norms and Surabaya Debarkation practice shows a layered implementation pattern with varying levels of compliance, not a single failure or success. Conveyance and information surveillance shows documented compliance with 116 aircraft supervised and HPAGD and TKHK information utilized. Person surveillance and risk factor detection shows documented compliance with temperature/symptom screening and medical examination conducted. Laboratory examination shows documented compliance with limitations on risk-based coverage. Evacuation and referral shows documented compliance with ambulances, referral hospitals, and laboratory networks utilized. Regional notification shows documented procedural compliance with 27 notification letters issued, but outcomes cannot yet be assessed. SSHP shows partial compliance with 81.74% electronic coverage, but with pilgrims not completing and data quality/access issues. Integrated surveillance systems show partial compliance/technical gaps with multiple systems used but processing and data transfer still partly manual. Administrative data consistency shows documentation quality gaps with conflicting arrival numbers, Influenza A counts, and SSHP category totals. Full proof of all Annex 1 IHR capacities cannot be fully assessed as some capacity and readiness indicators are unavailable. Legal currency in the report shows documentation gaps as the surveillance section still refers to Minister of Health Regulation Number 45 of 2014 which had been revoked.

³⁹ N Bitsolas et al., "European Union Digital Passenger Locator Form System (EUdPLF) Development," *European Journal of Public Health* 31, no. Supplement_3 (2021), <https://doi.org/10.1093/eurpub/ckab164.660>.

⁴⁰ Hashim A. Mahdi et al., "Syndromic Surveillance of Respiratory-Tract Infections and Hand Hygiene Practice among Pilgrims Attended Hajj in 2021: A Cohort Study," *BMC Infectious Diseases* 22, no. 1 (2022), <https://doi.org/10.1186/s12879-022-07559-0>.

These findings align with IHR implementation research in various countries, where the existence of legal foundations does not automatically ensure point of entry readiness when coordination, laboratories, resources, facilities, communication, or financing do not function as one system.⁴¹ Regional analysis also places coordination, accountability, and institutional leadership as central issues for IHR capacity strengthening.⁴² Unlike the Tanzanian study which identified resource shortages as the primary barrier, the Surabaya findings suggest that information system interoperability and documentation quality are more significant challenges, even when physical resources (ambulances, laboratory access) are available. The Surabaya findings extend this literature by showing that implementation challenges can arise not only as physical facility deficiencies, but also as information system incompleteness and documentation consistency needed to prove norm implementation. A critical observation that both supports and challenges existing literature is that while the Surabaya Debarkation demonstrated functional screening and referral systems comparable to those documented in other point of entry studies, the persistent gaps in data quality, interoperability, and follow-up documentation suggest that operational capacity does not automatically translate into surveillance effectiveness. This finding challenges the assumption that the presence of screening activities alone constitutes adequate public health response, and instead supports the argument that systematic evaluation of surveillance outcomes is essential.⁴³

CONCLUSION

This study reveals that health quarantine implementation at the Surabaya Hajj Debarkation 1447 H/2026 M demonstrates a layered pattern of compliance rather than a singular success or failure. The documented evidence shows that core functions including conveyance surveillance, temperature and symptom screening, risk-based laboratory examination, evacuation and referral, and regional notification have been operationalized in alignment with applicable legal norms under Law Number 17 of 2023 and the amended International Health Regulations. However, significant gaps persist in the completeness of the SSHP health declaration, data quality and consistency, information system interoperability, partially manual data processing, and limited documented evidence regarding post-return follow-up completion. The transition from a specific quarantine law regime

⁴¹ Edith Bakari and Gasto Frumence, "Challenges to the Implementation of International Health Regulations (2005) on Preventing Infectious Diseases: Experience from Julius Nyerere International Airport, Tanzania," *Global Health Action* 6, no. 1 (2013), <https://doi.org/10.3402/gha.v6i0.20942>; Queiroz et al., "Assessment of the Implementation of the International Health Regulations during the COVID-19 Pandemic: Portugal as a Case Study."

⁴² Kai Xiao et al., "Progress on International Health Regulations (2005) Core Capacities in WHO's Western Pacific Region," *Western Pacific Surveillance and Response Journal: WPSAR* 16, no. 3 (2025), <https://doi.org/10.5365/wpsar.2025.16.3.1245>.

⁴³ Maddah et al., "Effectiveness of Public Health Digital Surveillance Systems for Infectious Disease Prevention and Control at Mass Gatherings: Systematic Review."

toward integrated regulation within the broader health law framework has created new normative architecture, yet the translation of these norms into consistent operational practice remains incomplete. The findings demonstrate that the relationship between law in books and law in action at the Surabaya Debarkation is best understood as implementation that has progressed on many core functions but has not achieved uniformity in completeness, integration, traceability, and continuity of surveillance.

The theoretical contribution of this study lies in demonstrating that legal implementation in health quarantine cannot be assessed merely by the presence of activities, but must be evaluated through the connectivity of the detection-notification-response chain, the consistency of documentation, and the continuity of surveillance beyond the point of entry. This finding challenges the assumption that operational capacity automatically translates into surveillance effectiveness, and instead supports the argument that systematic evaluation of surveillance outcomes is essential. The study also contributes methodologically by integrating positive legal analysis with administrative data audit, showing how documentary evidence can be used to assess norm-practice gaps in health quarantine implementation. These contributions extend the existing literature by revealing that implementation challenges arise not only as physical facility deficiencies but also as information system incompleteness and documentation quality issues that affect the ability to prove norm compliance.

Strengthening health quarantine requires developing an integrated detection-notification-response chain with data standardization and closed-loop follow-up mechanisms, designing digital health declaration systems with interoperability and accessibility for diverse populations, and conducting periodic regulatory audits to ensure operational guidelines remain aligned with current legislation. This study is limited by its document-based design, reliance on administrative data not designed for research purposes, and the absence of individual-level longitudinal data linking screening results to follow-up outcomes. These limitations mean that the study can assess procedural compliance (whether activities were documented as conducted) but cannot assess substantive effectiveness (whether these activities actually prevented disease transmission). This distinction is crucial for interpreting the findings. Future studies should investigate: (1) the factors influencing low digital literacy among elderly pilgrims and potential interventions; (2) the technical and institutional barriers to system interoperability; and (3) the effectiveness of closed-loop follow-up mechanisms in detecting secondary transmission.

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