PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

Title (Provisional)

Development of an Evaluation Program for the Intelligent Management of Mobile Infectious Disease Hospitals in Response to Public Health Emergencies: A Delphi Study

Authors

He, Juanling; Wu, Sifeng; Ni, Rongrong; Luo, Xu

VERSION 1 - REVIEW

Reviewer	**1**
Name	**Zhu, Jiming**
Affiliation	**Tsinghua University**
Date	**05-Dec-2024**
COI	**None**

The paper focuses on employing the Delphi method to develop an intelligent management assessment program for mobile infectious disease hospitals. While the subject matter is interesting, the content lacks an in-depth discussion and contribution to both knowledge and practice. Specifically:

1. The background fails to analyze current research gaps adequately and explain the necessity for developing a new assessment tool.

2. In the Study Design section, more references should be included to justify the selection of experts, including their respective fields and job roles.

3. The discussion section requires a more profound exploration of contributions, supported by a wider range of literature.

4. Since the tool has not been validated in practice, it is advisable to emphasize that experts acknowledge the value of the tool rather than overtly promoting its benefits.

5. The academic writing needs enhancement.

Reviewer	**2**

Name	**Salome, Geraldo Magela**
Affiliation	**Univ Vale do Sapucai UNIVAS**
Date	**02-Jan-2025**
COI	**None**

the theme is relevant, but has minor corrections

The reviewer provided a marked copy with additional comments. Please contact the publisher for full details.

Reviewer	**3**
Name	**Bertolaccini, Luca**
Affiliation	**European Institute of Oncology**
Date	**12-Feb-2025**
COI	**None**

The manuscript presents a structured approach to developing a scientifically robust and practical assessment framework for managing mobile infectious disease hospitals.

Major shortcomings

1. The study focuses on mobile infectious disease hospitals in China, with expert consultations limited to a specific set of professionals. This raises concerns about the proposed assessment framework's generalizability to other healthcare systems, particularly those in different economic, regulatory, and technological contexts.

2. While the Delphi method is a rigorous approach to expert consensus, the study does not include real-world validation of the assessment program in actual hospital settings. Without empirical testing, the effectiveness and applicability of the proposed indicators remain theoretical.

3. The selection criteria for the Delphi panel emphasize seniority and expertise, which is appropriate but may introduce selection bias. The lack of representation from front-line healthcare workers or administrative personnel directly involved in mobile hospital operations could lead to an overly theoretical model.

4. While the manuscript provides a comprehensive list of indicators, it lacks an in-depth discussion on how they will be implemented in practice. Operational challenges, cost implications, and potential resistance from hospital staff are not adequately addressed.

5. The study calculates consensus measures (e.g., Cr values and Kendall's W) to ensure reliability, but it does not test the assessment program using accurate hospital data. Delphi

alone without external validation (e.g., pilot implementation or retrospective case evaluation) limits the robustness of the findings.

6. The study employs the Analytic Hierarchy Process (AHP) to assign weights to different indicators. Still, it does not provide a clear rationale for how the pairwise comparisons were made or whether sensitivity analysis was conducted to test the stability of the weights.

7. The study presents descriptive statistics (e.g., means, standard deviations, and coefficient of variation) but does not apply inferential statistical tests to compare expert responses across different rounds. A statistical analysis of inter-rater reliability (e.g., Cohen's kappa) or subgroup comparisons (e.g., differences in responses by profession or region) could strengthen the validity of the Delphi findings.

8. The manuscript sets a cutoff of 70% agreement for indicator inclusion but does not provide empirical justification for why this threshold was chosen. Conducting sensitivity analysis would enhance the credibility of the selection process.

VERSION 1 - AUTHOR RESPONSE

Response to the comments of reviewer #1

Q1. **The background fails to analyze current research gaps adequately and explain the necessity for developing a new assessment tool.**

Reply: Thank you very much for the constructive feedback. In the original introduction, we did not delve deeply enough into the research gaps or the need for developing new evaluation tools. In response, we have now supplemented the background section with a relevant literature review, which compares the limitations of existing evaluation tools when applied to mobile infectious disease hospitals. By incorporating real-world case studies, we illustrate how these limitations affect the development of mobile infectious disease hospitals and public health security. We also highlight the importance of smart technologies in mobile infectious disease hospitals, strengthening our argument for the necessity of advancing their intelligent construction and, consequently, the need for new evaluation tools.

The revised content is as follows:

"**INTRODUCTION**

In recent years, the global health landscape has evolved continuously, with the persistent threat of infectious diseases remaining a significant concern. As noted by WHO Director-General Tedros Adhanom Ghebreyesus at the 76th World Health Assembly, new variants may emerge, triggering further outbreaks, or more lethal pathogens may appear. These crises challenge not only the emergency response capabilities of public health systems but also expose the limitations of traditional medical facilities in managing large-scale infectious disease outbreaks. Preparing for the next pandemic requires ensuring a rapid, coordinated, and equitable response.[1]

Mobile infectious disease hospitals, designed based on the 'three-prevention' medical rescue concept and the 'three zones and two passages' principle for infectious diseases, are temporary facilities established to address major outbreaks in complex environments. Equipped with essential medical resources, such as isolation areas, diagnostic devices, treatment zones, and pharmaceutical reserves, these hospitals provide immediate care and isolation for patients. Various forms of mobile infectious disease hospitals, including cabin hospitals, field tent hospitals, and vehicle-based hospitals, can be rapidly deployed and adapted to diverse conditions.[2,3] As such, they are a critical component in enhancing public health emergency response capacity.

Currently, there is no unified index system for the intelligent evaluation of mobile infectious disease hospitals. Existing studies typically adopt case analyses, such as single negative pressure ward module evaluations, but lack quantitative standards covering infection control efficiency, medical process response speed, equipment stability, and other dimensions.[2] Additionally, most evaluation tools follow a fixed framework, which makes them difficult to adapt to the various forms of mobile hospitals (e.g., tent hospitals, vehicle-based hospitals, shelter hospitals) and operating models (temporary isolation versus long-term infectious disease treatment). Literature also points out that tent hospitals have limited effectiveness in extreme weather conditions, while vehicle-based hospitals depend on road conditions. However, existing tools do not offer the flexibility to dynamically adjust indicators.[4]

A systematic review of the existing literature highlights a significant research gap. There is a clear lack of a targeted and adaptable smart management evaluation tool for mobile infectious disease hospitals. Developing such a tool is crucial. For instance, during the COVID-19 pandemic, mobile infectious disease hospitals, such as cabin hospitals in China, played a pivotal role. However, management efficiency varied significantly among different facilities. Industry data indicates that approximately 30% of mobile infectious disease hospitals encountered challenges in resource allocation and patient flow management.[5,6] A well-designed smart management evaluation tool could have facilitated the timely identification of issues and improved management efficiency.

The Grading and Evaluation Standard System for Smart Hospital Services (Trial), issued by China's National Health Commission, advocates the transformation of medical institutions toward intelligence and digitalization, providing a policy foundation for the smart management of mobile infectious disease hospitals.[7] In this context, the current study explores methods to enhance management efficiency based on the unique features and operational challenges of mobile infectious disease hospitals, ultimately developing a smart management evaluation framework. This framework aims to serve as an effective tool for improving the intelligent management of these hospitals."

1 WHO director-general's opening remarks at the public hearing regarding a new international instrument on pandemic preparedness and response – 12 april 2022. https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-public-hearing-regarding-a-new-international-instrument-on-pandemic-preparedness-and-response---12-april-2022 (accessed 26 September 2024)

2 Cho K, Bae C, Nam T. Assessing a mobile and modular negative pressure ward(mobile clinic module) for COVID-19 outpatient treatment. IASDR Conf Ser. Published Online First: 9 October 2023.

3 Shi F, Li H, Liu R, et al. Emergency preparedness and management of mobile cabin hospitals in China during the COVID-19 pandemic. Front Public Health. 2022;9:763723. doi: 10.3389/fpubh.2021.763723

4 Wang Y, Wang L, Wu X, et al. Conceptual design of the "private car" self-isolation ecosystem for the 2019-nCoV infection. Int J Environ Res Public Health. 2022;19:10385. doi: 10.3390/ijerph191610385

5 Zhu J, Zhu G-P, Weng Y-M, et al. Clinical practice and effectiveness analysis of the management of corona virus disease 2019 infected at shanghai fangcang shelter hospital: a descriptive study. Risk Manag Healthc Policy. 2023;16:337–46. doi: 10.2147/RMHP.S403414

6 Ma S, Wang H, Zhu K, et al. Risk factors and disease profile associated with the nucleic acid conversion time of COVID-19 patients infected with the SARS-CoV-2 omicron variant in fangcang shelter hospitals. Infect Drug Resist. 2023;16:3945–54. doi: 10.2147/IDR.S410086

7 Notice of the general office of the national health commission on printing and distributing the grading and evaluation standard system for hospital smart management (trial).

http://www.nhc.gov.cn/yzygj/s3594q/202103/10ec6aca99ec47428d2841a110448de3.shtml (accessed 26 September 2024)

***Q2.* In the Study Design section, more references should be included to justify the selection of experts, including their respective fields and job roles.**

Reply: We thank the reviewer for the insigtful comment. In composing our expert panel, we implemented a rigorous dual-criteria approach that balanced both academic credentials and practical operational experience in infectious disease control, hospital management, and mobile medical technology. In the 'Setting and Participants' section, we have added citations from 2-3 relevant references regarding expert selection. When selecting experts for our project, we considered its unique characteristics, meaning that the research team needed to account for not just the experts' titles, but also their current professional backgrounds. As a result, several experts with intermediate titles who had participated in similar mobile infectious disease hospital projects were chosen due to their practical experience.

Furthermore, the intelligent management evaluation system for mobile infectious disease hospitals studied in this project aligns with both the disciplinary characteristics of infectious diseases and the scientific management requirements. Consequently, the professional backgrounds of the selected experts had to encompass not only emergency management and infectious disease management, but also expertise in hospital informatization.

The revised content is as follows:

“The selection of Delphi experts was based on their extensive knowledge, experience, and relevant expertise to ensure a comprehensive understanding of the research question.[23] Furthermore, the literature emphasizes that experts must possess advanced knowledge and specialized skills pertinent to the research context.[24] Given the specificity of the subject, the research team selected experts not only for their professional titles but also for their relevant professional experience. Several experts with mid-level titles, who had actively contributed to the construction of similar mobile infectious disease hospitals, were selected due to their demonstrated practical experience. The smart management evaluation system developed in this study aligns with both the disciplinary-specific characteristics of infectious diseases and the rigorous standards of scientific management. Therefore, the selected experts' professional backgrounds included expertise in emergency management, infectious disease management, and hospital informatization.”

23 Land L. The delphi method research strategy in studies of information systems.

Commun Assoc Inf Syst. Published Online First: 1 January 2015.

24 Zulkifli N. Fuzzy delphi techniques: Creative teaching model design for polytechnic islamic education lecturers. Int J Acad Res Progress Educ Dev.

Q3. **The discussion section requires a more profound exploration of contributions, supported by a wider range of literature.**

Reply: Thank you very much for your attention and suggestions regarding the discussion section. We acknowledge that our initial discussion of the research contributions lacked in-depth and sufficient literature support. In response, we have reorganized our findings and added extensive citations to each section, making the discussion more persuasive.

In elaborating on the scientific basis of the intelligent assessment needs repository, we not only discussed the principles of three-prevention medical rescue, design concepts for infectious disease control, and the integration of advanced technologies, but also cited several policy documents. These include the 'Opinions on Promoting the Development of 'Internet + Medical Health' by the Council Office, the 'Trial Evaluation Standards System for Smart Medical Services in Hospitals,' and the 'Technical Guidelines for Hospital Informatization Construction and Application (2017 Edition).' This demonstrates the research's in-depth exploration of the policy foundation, theory-practice integration, and highlights its significant contribution to promoting the fusion of healthcare and emerging technologies while standardizing intelligent management evaluation.

Regarding the reliability of the intelligent assessment needs repository, we used the 'National Public Health Emergency Response Plan' as an example to illustrate how the Delphi method adheres to scientific principles, leverages expert input, and enhances the scientific rigor of decision-making during public health emergencies. Furthermore, the 'Opinions on Strengthening the Standardized System Construction of National Health Information' underscores its guiding significance in standardizing data collection and indicator settings in intelligent management evaluation systems. This further emphasizes the value of our study in ensuring system reliability and data standardization.

In discussing the construction significance, we cited key documents such as the 'Law of the People's Republic of China on the Prevention and Treatment of Infectious Diseases' and the 'Notice on Further Promoting the Informatization Construction of Medical Institutions with Electronic Medical Records at the Core.' These citations clearly highlight the critical role of the intelligent management evaluation framework in enhancing hospital capabilities in infectious disease prevention, monitoring, early warning, and treatment, as well as facilitating information circulation and sharing through electronic medical records. This detailed discussion further underscores the study's substantial contributions to public health security and hospital informatization construction.

The revised content is as follows:

"**DISCUSSION**

The intelligent assessment requirements pool for mobile infectious disease hospitals is grounded in scientific principles.

The development of the evaluation item pool is based on the principles of tri-defense medical rescue and the "three zones and two passages" design for infectious disease control, incorporating advanced technologies such as the Internet of Things (IoT), big data, and artificial intelligence (AI). This approach rigorously follows relevant policy guidelines, ensuring a strong integration of theory and practice. The *"Opinions of the General Office of the State Council on Promoting the Development of 'Internet + Medical Health"* [33]] advocates for the integration of the internet with healthcare services, leveraging emerging technologies to improve the quality and efficiency of medical services. This provides essential policy guidance for the application of IoT, big data, and AI in the project. Additionally, the *"Grading Evaluation Standard System for Smart Healthcare Services in Hospitals (Trial)"* [34] sets clear evaluation criteria for healthcare services at various stages, including pre-diagnosis, diagnosis, and post-diagnosis. This project adheres strictly to these standards, ensuring the standardization and scientific integrity of the evaluation process. Furthermore, the *"Technical Guidelines for Hospital Informatization Construction and Application (2017 Edition)"* [35] offers comprehensive technical guidance on infrastructure, information systems, and data governance, providing essential operational norms for the smart management evaluation of mobile infectious disease hospitals. This ensures the scientifically sound application of advanced technologies. The research team conducted two rounds of expert consultations, incorporating multiple revisions to develop a comprehensive evaluation framework comprising 29 indicators for the smart management of mobile infectious disease hospitals. This framework not only addresses the operational requirements for non-contact services during sudden outbreaks of infectious diseases, but also takes into account the essential features of smart development and construction. It serves as a tool for assessing the level of smart construction in these hospitals, ensuring a solid scientific foundation for indicator setting.

Reliability of intelligent assessment requirement pool for mobile infectious disease

hospital

This study, referencing the *"Grading Evaluation Standard System for Hospital Smart Management (Trial)"* [34], systematically evaluates the likelihood, severity, and characteristics of sudden infectious disease outbreaks, as well as the specific needs of mobile infectious disease hospitals. A practical smart management evaluation system for these hospitals was developed through the application of the Delphi method. The *"National Contingency Plan for Public Health Emergencies"* [36] emphasizes the significance of adhering to scientific principles, promoting collaboration, leveraging expert insights, and enhancing the scientific validity and effectiveness of public health emergency responses. As a structured group decision-making method, the Delphi method is characterized by anonymous communication, iterative feedback, and statistical analysis. It harnesses the collective expertise of participants, combining professional knowledge, practical experience, and subjective judgment. After two rounds of expert consultations, the variation coefficient for all indicators fell below 0.25, indicating a high degree of consensus among experts on each indicator. Throughout the process, experts' opinions remained independent and were scarcely swayed by authoritative figures, thereby leading to more robust and credible outcomes.[37] Additionally, the *"Opinions on Strengthening the Standardization System Construction of National Health Information"* [38] advocates for the standardization of national health information, providing guidelines for data collection, indicator setting, and related aspects within the evaluation system for mobile infectious disease hospitals. This not only reinforces the reliability of the system, but also ensures data comparability and the measurability of indicators across hospitals.

Construction of an intelligent assessment requirements pool for mobile infectious disease hospitals holds significance.

The primary objective of smart management evaluation is to ensure that hospitals deliver comprehensive, accurate, and continuous smart healthcare services throughout their entire lifecycle.[34] This is especially critical in the context of infectious disease prevention and control, as it directly impacts the safety of patients, medical personnel, and the broader public health system.[39,40] The *"Law of the People's Republic of China on the Prevention and Treatment of Infectious Diseases"* [41] mandates the strengthening of efforts in monitoring, early warning, epidemic reporting, and improving prevention and treatment capabilities. In the wake of the COVID-19 pandemic, the importance of intelligent medical systems has significantly increased. The adoption of paperless closed-loop management through information technology not only alleviates clinical burdens but also improves operational efficiency and service quality.[42] Considering the evolving needs of hospitals, technical feasibility, and patient experience, the development of a smart management evaluation framework for mobile infectious disease hospitals can identify deficiencies in areas such as the functionality of smart service systems, the scope of application, technical infrastructure, and information security. This enables targeted improvements and better equips hospitals to effectively respond to future public health crises. The *"Notice on Further Promoting the Construction of Informationization in Medical Institutions with Electronic Medical Records at the Core"* [43] emphasizes the crucial role of electronic medical records in the digital transformation of medical institutions. For mobile infectious disease hospitals, a robust electronic medical record system facilitates the rapid sharing of information, enhances smart management capabilities, and provides essential data to respond to infectious disease outbreaks. This further highlights the critical need for a smart management evaluation framework in mobile infectious disease hospitals."

33 Opinions of the General Office of the State Council on Promoting the Development of "Internet + Medical Health"_Health_China Government Network . https://www.gov.cn/zhengce/content/2018-04/28/content_5286645.htm (accessed 20 April 2024)

34 Notice of the general office of the national health and health commission on printing and distributing the hospital intelligent management grading evaluation standard system (trial). http://www.nhc.gov.cn/yzygj/s3594q/202103/10ec6aca99ec47428d2841a110448de3.shtml (accessed 28 March 2024)

35 Notice of the General Office of the National Health and Family Planning Commission on Printing and Distributing the Technical Guidelines for the Application of Hospital Informatization Construction (2017 Edition). http://www.nhc.gov.cn/guihuaxxs/gongwen12/201712/aed4d45c8f75467fb208b4707cceb0ad.shtml (accessed 14 January 2025)

36 National emergency plan for public health emergencies. https://www.gov.cn/yjgl/2006-02/26/content_211654.htm (accessed 31 May 2023)

37 Ren Y, Li D, Pan C, et al. Application of Delphi method in clinical pharmacy. Evaluation and analysis of drug use in hospitals in China. 2019;19:1525–7. doi: 10.14009/j.issn.1672-2124.2019.12.031

38 Opinions on Strengthening the Construction of National Health Information Standardization System. http://www.nhc.gov.cn/guihuaxxs/pqt/202010/4114443b613546148b275f191da4662b.shtml

(accessed 14 January 2025)

39 Wang Yang. Notice on Further Promoting the "Five Ones" Service Action of "Internet + Medical Health"_Documents of the State Council_China Government Network. https://www.gov.cn/zhengce/zhengceku/2020-12/10/content_5568777.htm (accessed 24 July 2024)

40 Complementing weaknesses, strengthening items and improving ability to promote the informatization construction of infectious disease hospitals. https://www.zssph.com/article/2643 (accessed 24 July 2024)

41 Law of the People's Republic of China on the Prevention and Control of Infectious Diseases_China People's Congress Network. http://www.npc.gov.cn/npc/c2/c238/202001/t20200122_304251.html (accessed 14 January 2025)

42 Zhang Xiang, Zhang Xiaoliang, Li Lin. Improve the reporting and management of infectious diseases by using hospital information system. Modern preventive medicine. 2019;46:3544–7.

43 Xue Yuan. Notice on Further Promoting the Informatization Construction of Medical Institutions with Electronic Medical Records as the Core_Documents of the State Council_China Government Network. https://www.gov.cn/zhengce/zhengceku/2018-12/31/content_5435418.htm (accessed 8 May 2024)

Q4. **Since the tool has not been validated in practice, it is advisable to emphasize that experts acknowledge the value of the tool rather than overtly promoting its benefits.**

Reply: Your suggestions are very reasonable. We acknowledge that our previous description lacked sufficient rigor and may have over-emphasized the benefits of the tool before it has been validated. In response, we have revised the discussion section to emphasize the scientific rigor and reliability involved in constructing an intelligent evaluation system for mobile infectious disease hospitals. Additionally, we explored the significance of advancing the smartization of these hospitals, supported by relevant policy documents. Furthermore, we have incorporated a discussion of the strengths and limitations of this study within the main text. Regarding the limitations, we explicitly noted that the tool has not yet been comprehensively validated in actual applications, and its effectiveness and practicality require further testing in subsequent practices.

The revised content is as follows:

“DISCUSSION

The intelligent assessment requirements pool for mobile infectious disease hospitals is grounded in scientific principles.

The development of the evaluation item pool is based on the principles of tri-defense medical rescue and the "three zones and two passages" design for infectious disease control, incorporating advanced technologies such as the Internet of Things (IoT), big data, and artificial intelligence (AI). This approach rigorously follows relevant policy guidelines, ensuring a strong integration of theory and practice. The *"Opinions of the General Office of the State Council on Promoting the Development of 'Internet + Medical Health"* [33]] advocates for the integration of the internet with healthcare services, leveraging emerging technologies to improve the quality and efficiency of medical services. This provides essential policy guidance for the application of IoT, big data, and AI in the project. Additionally, the *"Grading Evaluation Standard System for Smart Healthcare Services in Hospitals (Trial)"* [34] sets clear evaluation criteria for healthcare services at various stages, including pre-diagnosis, diagnosis, and post-diagnosis. This project adheres strictly to these standards, ensuring the standardization and scientific integrity of the evaluation process. Furthermore, the *"Technical Guidelines for Hospital Informatization Construction and Application (2017 Edition)"* [35] offers comprehensive technical guidance on infrastructure, information systems, and data governance, providing essential operational norms for the smart management evaluation of mobile infectious disease hospitals. This ensures the scientifically sound application of advanced technologies. The research team conducted two rounds of expert consultations, incorporating multiple revisions to develop a comprehensive evaluation framework comprising 29 indicators for the smart management of mobile infectious disease hospitals. This framework not only addresses the operational requirements for non-contact services during sudden outbreaks of infectious diseases, but also takes into account the essential features of smart development and construction. It serves as a tool for assessing the level of smart construction in these hospitals, ensuring a solid scientific foundation for indicator setting.

Reliability of intelligent assessment requirement pool for mobile infectious disease hospital

This study, referencing the *"Grading Evaluation Standard System for Hospital Smart Management (Trial)"* [34], systematically evaluates the likelihood, severity, and characteristics of sudden infectious disease outbreaks, as well as the specific needs of mobile infectious disease hospitals. A practical smart management evaluation system for these hospitals was developed through the application of the Delphi method. The *"National Contingency Plan for Public Health Emergencies"* [36] emphasizes the significance of adhering to scientific principles, promoting collaboration, leveraging expert insights, and enhancing the scientific validity and effectiveness of public health emergency responses. As a structured group decision-making method, the Delphi method is characterized by anonymous communication, iterative feedback, and statistical analysis. It harnesses the collective expertise of participants, combining professional knowledge, practical experience, and subjective judgment. After two rounds of expert consultations, the variation coefficient for all indicators fell below 0.25, indicating a high degree of consensus among experts on each indicator. Throughout the process, experts' opinions remained independent and were scarcely swayed by authoritative figures, thereby leading to more robust and credible outcomes.[37] Additionally, the *"Opinions on Strengthening the Standardization System Construction of National Health Information"* [38] advocates for the standardization of national health information, providing guidelines for data collection, indicator setting, and related aspects within the evaluation system for mobile infectious disease hospitals. This not only reinforces the reliability of the system, but also ensures data comparability and the measurability of indicators across hospitals.

Construction of an intelligent assessment requirements pool for mobile infectious disease hospitals holds significance.

The primary objective of smart management evaluation is to ensure that hospitals deliver comprehensive, accurate, and continuous smart healthcare services throughout their entire lifecycle.[34] This is especially critical in the context of infectious disease prevention and control, as it directly impacts the safety of patients, medical personnel, and the broader public health system.[39,40] The *"Law of the People's Republic of China on the Prevention and Treatment of Infectious Diseases"* [41] mandates the strengthening of efforts in monitoring, early warning, epidemic reporting, and improving prevention and treatment capabilities. In the wake of the COVID-19 pandemic, the importance of intelligent medical systems has significantly increased. The adoption of paperless closed-loop management through information technology not only alleviates clinical burdens but also improves operational efficiency and service quality.[42] Considering the evolving needs of hospitals, technical feasibility, and patient experience, the development of a smart management evaluation framework for mobile infectious disease hospitals can identify deficiencies in areas such as the functionality of smart service systems, the scope of application, technical infrastructure, and information security. This enables targeted improvements and better equips hospitals to effectively respond to future public health crises. The *"Notice on Further Promoting the*

Construction of Informationization in Medical Institutions with Electronic Medical Records at the Core" [43] emphasizes the crucial role of electronic medical records in the digital transformation of medical institutions. For mobile infectious disease hospitals, a robust electronic medical record system facilitates the rapid sharing of information, enhances smart management capabilities, and provides essential data to respond to infectious disease outbreaks. This further highlights the critical need for a smart management evaluation framework in mobile infectious disease hospitals."

"STRENGTHS AND LIMITATIONS

This study strictly adheres to relevant policy guidelines in the initial development of an evaluation system for the smart capabilities of mobile infectious disease hospitals, while innovatively applying the Delphi method to create metrics tailored to China's national context. To ensure the system is both professional and practical, experts with extensive experience in mobile infectious disease hospitals, along with those with relevant expertise, were recruited for the study. Their in-depth and practical expertise provided valuable insights. Methodologically, the study combines the Delphi method with the Analytic Hierarchy Process (AHP), to precisely calculate indicator values to ensure the evaluation system's scientific rigor and reliability. The current evaluation framework specifically tailored to the unique characteristics of mobile infectious disease hospitals in China, integrating domain-specific expertise to enhance both applicability and practical value in real-world healthcare scenarios.

However, it should be noted that the framework, designed primarily based on China's healthcare ecosystem and domestic expert consensus, may lack direct applicability in international medical contexts. Furthermore, as it has not undergone rigorous validation in clinical practice settings, the effectiveness and applicability of the proposed indicators remain largely theoretical, thereby limiting their potential for broader application. Subsequent phases of this research will prioritize practical verification to optimize the system's cross-cultural generalizability and practical value."

33 Opinions of the General Office of the State Council on Promoting the Development of "Internet + Medical Health"_Health_China Government Network . https://www.gov.cn/zhengce/content/2018-04/28/content_5286645.htm (accessed 20 April 2024)

34 Notice of the general office of the national health and health commission on printing and distributing the hospital intelligent management grading evaluation standard system (trial).

http://www.nhc.gov.cn/yzygj/s3594q/202103/10ec6aca99ec47428d2841a110448de3.shtml (accessed 28 March 2024)

35 Notice of the General Office of the National Health and Family Planning Commission on Printing and Distributing the Technical Guidelines for the Application of Hospital Informatization Construction (2017 Edition).

http://www.nhc.gov.cn/guihuaxxs/gongwen12/201712/aed4d45c8f75467fb208b4707cceb0ad.shtml (accessed 14 January 2025)

36 National emergency plan for public health emergencies.

https://www.gov.cn/yjgl/2006-02/26/content_211654.htm (accessed 31 May 2023)

37 Ren Y, Li D, Pan C, et al. Application of Delphi method in clinical pharmacy. Evaluation and analysis of drug use in hospitals in China. 2019;19:1525–7. doi: 10.14009/j.issn.1672-2124.2019.12.031

38 Opinions on Strengthening the Construction of National Health Information Standardization System.

http://www.nhc.gov.cn/guihuaxxs/pqt/202010/4114443b613546148b275f191da4662b.shtml (accessed 14 January 2025)

39 Wang Yang. Notice on Further Promoting the "Five Ones" Service Action of "Internet + Medical Health"_Documents of the State Council_China Government Network. https://www.gov.cn/zhengce/zhengceku/2020-12/10/content_5568777.htm (accessed 24 July 2024)

40 Complementing weaknesses, strengthening items and improving ability to promote the informatization construction of infectious disease hospitals. https://www.zssph.com/article/2643 (accessed 24 July 2024)

41 Law of the People's Republic of China on the Prevention and Control of Infectious Diseases_China People's Congress Network.

http://www.npc.gov.cn/npc/c2/c238/202001/t20200122_304251.html (accessed 14 January 2025)

42 Zhang Xiang, Zhang Xiaoliang, Li Lin. Improve the reporting and management of infectious diseases by using hospital information system. Modern preventive medicine. 2019;46:3544–7.

43 Xue Yuan. Notice on Further Promoting the Informatization Construction of Medical Institutions with Electronic Medical Records as the Core_Documents of the State Council_China Government Network. https://www.gov.cn/zhengce/zhengceku/2018-

12/31/content_5435418.htm (accessed 8 May 2024)

Q5. **The academic writing needs enhancement.**

Reply: Thank you for your insightful comment and kind suggestion. We have made every effort to polish the language in the revised manuscript. Acknowledging the deficiencies in our initial academic writing, we thoroughly reviewed the article for issues related to grammar, vocabulary usage, and logical structure. Regarding grammar, we carefully examined the subject-verb-object structure and ensured tense consistency throughout the manuscript. For vocabulary usage, we focused on accuracy and professionalism in the selection of terms. In terms of logical structure, we optimized transitions and improved the coherence between paragraphs to enhance the article's rigor and standardization. We also simplified and clarified complex sentence structures, replaced colloquial terms with more academic terminology, and added transitional sentences at the beginning or end of paragraphs to ensure a smoother flow of content.

Response to the comments of reviewer #3

Q1. **The study focuses on mobile infectious disease hospitals in China, with expert consultations limited to a specific set of professionals. This raises concerns about the proposed assessment framework's generalizability to other healthcare systems, particularly those in different economic, regulatory, and technological contexts.**

Reply: Thank you for pointing out these critical issues. This study focuses on mobile infectious disease hospitals in China. In response, we have expanded the discussion in the main text to address the limitations of the evaluation framework. Specifically, we acknowledge that the current framework is primarily based on the opinions of professionals from mobile infectious disease hospitals in China, which may limit its applicability when extended to other healthcare systems.

The revised content is as follows:

"However, it should be noted that the framework, designed primarily based on China's healthcare ecosystem and domestic expert consensus, may lack direct applicability in international medical contexts. Furthermore, as it has not undergone rigorous validation in clinical practice settings, the effectiveness and applicability of the proposed indicators remain largely theoretical, thereby limiting their potential for broader application. Subsequent phases of this research will prioritize practical verification to optimize the system's cross-cultural generalizability and practical value.”

***Q2*. While the Delphi method is a rigorous approach to expert consensus, the study does not include real-world validation of the assessment program in actual hospital settings. Without empirical testing, the effectiveness and applicability of the proposed indicators remain theoretical.**

Reply: Thank you for your reminder. The lack of validation in a real hospital environment is a significant limitation of this study. To address this, we plan to conduct empirical research in the next phase by selecting representative mobile infectious disease hospitals in China and applying the evaluation system in those settings. Additionally, in the limitations section of the main text, we explicitly acknowledge the absence of empirical testing and outline our plans for future research aimed at further refining the evaluation system and enhancing its applicability in China.

The revised content is as follows:

“However, it should be noted that the framework, designed primarily based on China's healthcare ecosystem and domestic expert consensus, may lack direct applicability in international medical contexts. Furthermore, as it has not undergone rigorous validation in clinical practice settings, the effectiveness and applicability of the proposed indicators remain largely theoretical, thereby limiting their potential for broader application. Subsequent phases of this research will prioritize practical verification to optimize the system's cross-cultural generalizability and practical value.”

***Q3*. The selection criteria for the Delphi panel emphasize seniority and expertise, which is appropriate but may introduce selection bias. The lack of representation from front-line healthcare workers or administrative personnel directly involved in mobile hospital operations could lead to an overly theoretical model.**

Reply: Thank you for your valuable opinion. When selecting experts for the Delphi method, we prioritized qualifications and professional knowledge to ensure the authority of their opinions. Given the specific nature of this project, we not only considered the experts' titles but also took into account their current professional backgrounds. The intelligent management evaluation system for mobile infectious disease hospitals developed in this study aligns with both the disciplinary characteristics of infectious diseases and the requirements of scientific management. To ensure the inclusion of frontline healthcare workers, we selected several experts with intermediate titles who have practical experience in the construction of mobile infectious disease hospitals. Additionally, we have outlined the criteria for expert selection in the 'Setting and Participants' section of the main text, supported by relevant references.

The revised content is as follows:

"The selection of Delphi experts was based on their extensive knowledge, experience, and relevant expertise to ensure a comprehensive understanding of the research question.[23] Furthermore, the literature emphasizes that experts must possess advanced knowledge and specialized skills pertinent to the research context.[24] Given the specificity of the subject, the research team selected experts not only for their professional titles but also for their relevant professional experience. Several experts with mid-level titles, who had actively contributed to the construction of similar mobile infectious disease hospitals, were selected due to their demonstrated practical experience. The smart management evaluation system developed in this study aligns with both the disciplinary-specific characteristics of infectious diseases and the rigorous standards of scientific management. Therefore, the selected experts' professional backgrounds included expertise in emergency management, infectious disease management, and hospital informatization."

23 Land L. The delphi method research strategy in studies of information systems. Commun Assoc Inf Syst. Published Online First: 1 January 2015.

24 Zulkifli N. Fuzzy delphi techniques: Creative teaching model design for polytechnic islamic education lecturers. Int J Acad Res Progress Educ Dev.

***Q4.* While the manuscript provides a comprehensive list of indicators, it lacks an in-depth discussion on how they will be implemented in practice. Operational challenges, cost implications, and potential resistance from hospital staff are not adequately addressed.**

Reply: Thank you very much for pointing out this issue. We invested considerable effort in the initial construction and screening phases of the indicator system; however, our consideration of the implementation and application phases was not thorough enough. To address this, we plan to conduct empirical research in the next phase by selecting representative mobile infectious disease hospitals in China and applying the evaluation system in these settings. In the limitations section of the main text, we explicitly acknowledge the lack of empirical testing and outline our plans for future research aimed at refining the evaluation system and enhancing its applicability in China.

It is important to note that this study focuses on mobile infectious disease hospitals in China, which are non-fixed facilities designed for special circumstances or emergency situations. These hospitals primarily aim to respond to public health emergencies, such as pandemics, with the primary goal of protecting lives and property. Operational costs are not a primary concern during the operation of these hospitals. The purpose of their smartization is to reduce direct contact between medical staff and infectious disease patients, alleviate the pressure on medical personnel, and enhance the hospitals' capacity to control and prevent sudden outbreaks of infectious diseases.

The revised content is as follows:

"However, it should be noted that the framework, designed primarily based on China's healthcare ecosystem and domestic expert consensus, may lack direct applicability in international medical contexts. Furthermore, as it has not undergone rigorous validation in clinical practice settings, the effectiveness and applicability of the proposed indicators remain largely theoretical, thereby limiting their potential for broader application. Subsequent phases of this research will prioritize practical verification to optimize the system's cross-cultural generalizability and practical value."

***Q5.* The study calculates consensus measures (e.g., Cr values and Kendall's W) to ensure reliability, but it does not test the assessment program using accurate hospital data. Delphi alone without external validation (e.g., pilot implementation or retrospective case evaluation) limits the robustness of the findings.**

Reply: Thank you for your valuable suggestions regarding our article. This study calculated the relevant indicators using the Delphi method to ensure the scientific rigor and reliability of the evaluation system. While we invested considerable effort in the initial construction and screening phases of the indicator system, our consideration of the implementation and application phases was not thorough enough. To address this, we plan to conduct empirical research in the next phase by selecting representative mobile infectious disease hospitals in China and applying the evaluation system in these settings.

In the limitations section of the main text, we acknowledge the lack of empirical testing and outline our plans for future research to test the effectiveness and feasibility of the evaluation system. This will help identify both the advantages and limitations of the intelligent management evaluation needs project for mobile infectious disease hospitals in real-world operations, providing valuable insights for its optimization and improvement.

The revised content is as follows:

"However, it should be noted that the framework, designed primarily based on China's healthcare ecosystem and domestic expert consensus, may lack direct applicability in international medical contexts. Furthermore, as it has not undergone rigorous validation in clinical practice settings, the effectiveness and applicability of the proposed indicators remain largely theoretical, thereby limiting their potential for broader application. Subsequent phases of this research will prioritize practical verification to optimize the system's cross-cultural generalizability and practical value."

Q6. **The study employs the Analytic Hierarchy Process (AHP) to assign weights to different indicators. Still, it does not provide a clear rationale for how the pairwise comparisons were made or whether sensitivity analysis was conducted to test the stability of the weights.**

Reply： Your suggestions are invaluable. In our previous description of the AHP method for weight allocation, we did not clearly explain the basis for ensuring weight stability. To address this, we have supplemented the 'Procedure (Using AHP to Assign Weights)' section with a more detailed explanation, including specific operations for pairwise comparisons. Additionally, we have included a description of the stability of the AHP analysis results in this section.

The revised content is as follows:

"**Using the AHP to assign weights**

The Analytic Hierarchy Process (AHP) is a decision analysis method that combines qualitative and quantitative analysis. It decomposes indicators, establishes a hierarchical structure, and conducts pairwise comparison-based quantitative analysis.[28,29] In this study, we developed a hierarchical structure model, constructed a judgment matrix, and tested the consistency of the matrix to determine the weight of each indicator.

To determine the relative proportion of each indicator at a given level compared to the upper-level indicator (target or first-level indicator), the importance level was assigned using the Satty scale, based on the average importance scores provided by experts during the second round of inquiry. Pairwise comparisons were made between indicators at the same level, and a judgment matrix was constructed.[30] The Satty scale values are shown in Table 2.

Table 2 Satty scale of relative importance

Satty Scale Value	Mean difference in importance scores	Satty Scale Value	Mean difference in importance scores	Implication
1	X-Y=0.0	**1**		Equally important
2	0.00<X-Y≦0.25	**1/2**	-0.25<X-Y≦0.00	
3	0.25<X-Y≦0.50	**1/3**	-0.50<X-Y≦−0.25	Slightly more important
4	0.50<X-Y≦0.75	**1/4**	-0.75<X-Y≦−0.50	
5	0.75<X-Y≦1.00	**1/5**	-1.00<X-Y≦−0.75	Obviously important
6	1.00<X-Y≦1.25	**1/6**	-1.25<X-Y≦-1.00	
7	1.25<X-Y≦1.50	**1/7**	-1.50<X-Y≦-1.25	Strongly important
8	1.50<X-Y≦1.75	**1/8**	-1.75<X-Y≦-1.50	
9	X-Y〉1.75	**1/9**	X-Y〈11.75	Extremely important

X and Y represent the mean importance scores of two different indicators at the same level

The consistency index (CI) is typically used to check for logical inconsistencies in the relative priority order of items, calculated as: CI=(λmax-n)/(n-1).[31] The average random index (RI) is used to assess the consistency of judgment matrices of different orders.[32] The RI values differ depending on the matrix order, as shown in Table 2-4. When the matrix order is less than 2, CI is used to test the logical consistency of the relative order of indices within this hierarchy. For matrices of order greater than 2, RI is applied to correct CI, with the result reflected by the random consistency ratio (CR). The CR is calculated as: CR=CI/RI, A CR value less than 0.10 indicates satisfactory consistency in the judgment matrix .[32]"

28 Mehdialiyev A, Farziyev S, Aliyeva S. Method of analysis of hierarchies and its application to the problem "defining priorities in assessing various skills and competences of software engineers in hiring process." RS Global Conferences. Published Online First: 30 March 2021.

29 Rouse WB. Multi-level analyses. In: Rouse WB, ed. Failure Management: Malfunctions of Technologies, Organizations, and Society. Oxford University Press 2021:0.

30 Wang X, Tan K, Xu K, et al. Quantitative evaluation of the eco-environment in

a coalfield based on multi-temporal remote sensing imagery: a case study of yuxian, china. Int J Environ Res Public Health. 2019;16:511. doi: 10.3390/ijerph16030511

31 Liu Z, Qiao C. Development situations and performance evaluation of chinese government guide funds. J Econ Financ Stud. 2017;5:30. doi: 10.18533/jefs.v5i01.266

32 Zhang R, Meng H, Ge J, et al. A method for identifying the key performance shaping factors to prevent human errors during oil tanker offloading work. J Mar Sci Eng. 2022;10:688. doi: 10.3390/jmse10050688

Q7. **The study presents descriptive statistics (e.g., means, standard deviations, and coefficient of variation) but does not apply inferential statistical tests to compare expert responses across different rounds. A statistical analysis of inter-rater reliability (e.g., Cohen's kappa) or subgroup comparisons (e.g., differences in responses by profession or region) could strengthen the validity of the Delphi findings.**

Reply： Thank you for your valuable opinion. To enhance the scientific validity and effectiveness of the Delphi survey results, we have elaborated in detail on the Delphi evaluation indicators. To ensure the scientific rigor and rationality of the Delphi method, we calculated three key coefficients: the expert participation coefficient, the authority coefficient, and Kendall's coefficient of concordance. The expert participation coefficient mirrors the level of active engagement among experts and indicates the effective response rate to the expert consultation questionnaire, which in turn bolsters the credibility and scientific foundation of the results. The authority coefficient measures the expertise of the participants, with higher values indicating greater authority and more accurate predictions. Finally, Kendall's coefficient of concordance was used to assess the consistency of expert opinions. The results of these calculations are presented in tabular format and thoroughly analyzed and interpreted in the main text.

The revised content is as follows:

"**Delphi Correlation Index**

To ensure the scientific rigor and validity of the Delphi method, several key coefficients related to experts are calculated, namely the participation coefficient, authority coefficient, and Kendall's coefficient of concordance.

Participation Coefficient

In the application of the Delphi method, the participation coefficient of experts serves as an indicator of their active engagement. It is equivalent to the effective response rate to the expert consultation questionnaire. This coefficient plays a crucial role in determining the credibility and scientific basis of the results. Effective response rates above 55% are generally considered acceptable, while rates exceeding 70% are regarded as excellent for Delphi methods.[8]

Authority Coefficient (Cr)

The authority coefficient (Cr) is determined by two factors: the expert's familiarity with the index (Cs) and the basis for their judgment of the index (Ca). The authority coefficient is calculated as the arithmetic average of the judgment coefficient and the familiarity coefficient, i.e., Cr = (Cs + Ca) / 2. A higher Cr value indicates greater expert authority and enhanced prediction accuracy.[9–11]

The judgment basis (Ca) reflects the evidence that experts draw upon when making assessments, which may include practical experience, theoretical analysis, domestic and international peer knowledge, and intuition. The value of Ca typically ranges from 0 to 1, with higher values indicating more scientifically reliable expert judgments. The judgment coefficient and the average judgment coefficient are calculated based on the evaluation criteria presented in the table 1.[9–11]

Table1 Judgement basis and the degree of influence

Judgement basis	Degree of influence		
	High	Medium	Low
Practical experience	0.5	0.4	0.3
Theoretical analysis	0.3	0.2	0.1
Knowledge from domestic and foreign counterparts	0.1	0.1	0.1
Intuition	0.1	0.1	0.1
Total	1	0.8	0.6

The familiarity coefficient (Cs) reflects the expert's familiarity with the issue at hand. It is usually categorized into five levels: very unfamiliar (0), somewhat unfamiliar (0.3), generally familiar (0.5), quite familiar (0.7), and very familiar (1). The familiarity coefficient also ranges from 0 to 1, with higher values indicating greater expert familiarity with the issue.[9–11]

Kendall's coefficient of concordance

This coefficient evaluates the consistency and credibility of expert opinions.[12] Kendall’s W consistency coefficient test is used to assess the alignment of expert evaluations regarding the importance, feasibility, and sensitivity of each indicator.[13]”

8 Sun W, Dong X, Yu G, et al. Behavioral assessment scale of consciousness for nonhuman primates: a delphi study. Sci Prog. 2023;106:368504231200995. doi: 10.1177/00368504231200995

9 Shi J, Sun X, Meng K. Identifying organisational capability of hospitals amid the new healthcare reform in China: a delphi study. BMJ Open. 2021;11:e042447. doi: 10.1136/bmjopen-2020-042447

10 Zhao R, Liu F, Zhu K. Establishment of an evaluation index system of competencies for college senior students in general practice medicine in anhui province, china. Int J Gen Med. 2024;17:85–92. doi: 10.2147/IJGM.S420418

11 Feng X, Qu Y, Sun K, et al. Identifying strategic human resource management ability in the clinical departments of public hospitals in China: a modified delphi study. BMJ Open. 2023;13:e066599. doi: 10.1136/bmjopen-2022-066599

12 Geng J, Zhang J, Li L, et al. Construction of a learning satisfaction scale for nursing students with high-fidelity simulation based on the delphi method. Open J Soc Sci. 2020;8:1–10. doi: 10.4236/jss.2020.85001

13 Dobrovolskienė N, Pozniak A, Tvaronavičienė M. Assessment of the sustainability of a real estate project using multi-criteria decision making. Sustainability. 2021;13:4352. doi: 10.3390/su13084352

Q8. **The manuscript sets a cutoff of 70% agreement for indicator inclusion but does not provide empirical justification for why this threshold was chosen. Conducting sensitivity analysis would enhance the credibility of the selection process.**

Reply： Thank you for your suggestion. We acknowledge that, in setting the consistency cut-off value for indicator inclusion, we initially lacked empirical evidence. To address this, we reviewed relevant literature and referenced established methods and experiences regarding the determination of the cut-off value. In the 'Methods (Inclusion and Exclusion Criteria for Indicators)' section, we have now provided the basis for determining the cut-off value and explained the rationale for selecting a 70% threshold.

The revised content is as follows:

“**Inclusion and Exclusion Criteria for Indicators**

Delphi studies often use percent agreement as the standard for evaluating consistency.[14,15] In one study on the overall framework for building construction quality assessment, researchers suggested an acceptable range of 60% to 70%, with 70% being the threshold between "good" and "acceptable" agreement.[16] In a physical therapy skill assessment, 142 interventions were reduced to 29 after three rounds of Delphi, using expert consensus (with an agreement rate of over 70%) as the screening criterion.[17] Additionally, in a Delphi study for developing reporting guidelines for innovative surgical procedures and devices, items deemed very important by patients or professionals (or both) were retained for further investigation if they achieved ⩾ 70% agreement.[18] Evidently, setting 70% as a cutoff value for consistency meets the practical requirements in most decision-making scenarios. Therefore, in this study, the consensus criteria are as follows: if more than 70% of experts assign a consensus score of 7 or higher, the indicator is included; if more than 70% assign a score of 5 or lower, the indicator is excluded."

14 Humphrey-Murto S, Varpio L, Wood TJ, et al. The use of the delphi and other consensus group methods in medical education research: A review. Acad Med: J Assoc Am Med Coll. 2017;92:1491–8. doi: 10.1097/ACM.0000000000001812

15 Diamond IR, Grant RC, Feldman BM, et al. Defining consensus: a systematic review recommends methodologic criteria for reporting of delphi studies. J Clin Epidemiol. 2014;67:401–9. doi: 10.1016/j.jclinepi.2013.12.002

16 Alfalah G, Alasaibia A, Alshamrani O, et al. A holistic framework for assessing the quality of building construction in Saudi Arabia. Buildings. 2023;13:1666. doi: 10.3390/buildings13071666

17 Díaz-Mohedo E, Romero-Galisteo R, Suárez-Serrano C, et al. Rubric for the evaluation of competencies in traumatology in the degree of physiotherapy: delphi approach. BMC Med Educ. 2021;21:474. doi: 10.1186/s12909-021-02904-4

18 Avery K, Blazeby J, Wilson N, et al. Development of reporting guidance and core outcome sets for seamless, standardised evaluation of innovative surgical procedures and devices: a study protocol for content generation and a delphi consensus process (COHESIVE study). BMJ Open. 2019;9:e029574. doi: 10.1136/bmjopen-2019-029574

Response from the Authors

Thank you once again for your professional comments, which highlighted the issues mentioned above. We hope that these explanations adequately address your concerns.

VERSION 2 - REVIEW

Reviewer	**2**
Name	**Salome, Geraldo Magela**
Affiliation	**Univ Vale do Sapucai UNIVAS**
Date	**15-Mar-2025**
COI	

ok

Reviewer	**3**
Name	**Bertolaccini, Luca**
Affiliation	**European Institute of Oncology**
Date	**09-Mar-2025**
COI	

Some minor revisions should also be made.

1. The authors mention that real-world validation will be conducted in the next phase, but providing more details on how this will be approached could improve credibility.

2. The response acknowledges the study's limitation in being primarily based on Chinese experts but could briefly mention possible modifications to improve global applicability.

3. The response effectively addresses the reviewer's concern about methodological rigor but could slightly enhance the justification for expert selection.

VERSION 2 - AUTHOR RESPONSE

Response to the comments of reviewer #1

Reply: We thank Reviewer #1 for their positive feedback and confirmation that no further revisions are required.

Response to the comments of reviewer #2

Reply: We thank Reviewer #2 for their positive feedback and confirmation that no further revisions are required.

Response to the comments of reviewer #3

Q1. **1. The authors mention that real-world validation will be conducted in the next**

phase, but providing more details on how this will be approached could improve credibility.

Reply: We sincerely appreciate the experts' suggestions. In response to the additional questions concerning the research design for the validation stage, we have provided a detailed explanation of the subsequent empirical research plan in the STRENGTHS AND LIMITATIONS section (page 20, line 433) of the manuscript.

The revised content is as follows:

"In the subsequent validation phase, this study will select a mobile infectious disease hospital in China as the validation subject. This hospital has experience in emergency responses to public health incidents and comprises a multidisciplinary team, including clinical medical staff, operations management, information technology, and logistics support personnel. This diversity ensures a comprehensive perspective on the practical needs of intelligent construction.

The study will employ quantitative analysis to assess the alignment between the importance and existence of intelligent construction needs. Specifically, methods such as radar chart-based quantified scoring will be used to identify priority deviations within the 29-item evaluation system, thereby evaluating its applicability in real-world scenarios. The findings will provide empirical evidence for developing an evaluation index to assess the effectiveness of intelligent construction."

***Q2*. The response acknowledges the study's limitation in being primarily based on Chinese experts but could briefly mention possible modifications to improve global applicability.**

Reply: We appreciate the experts' suggestions and concur with their recommendations. In the STRENGTHS AND LIMITATIONS section (page 19, line 422), we have included a brief explanation emphasizing the importance of incorporating perspectives from experts in different regions to enhance global adaptability.

The revised content is as follows:

"To enhance the global applicability of the research findings, it is essential to gather and analyze perspectives from experts across multiple countries regarding the proposed evaluation system. This approach ensures broader representativeness of the conclusions. Additionally, incorporating case studies from various countries and regions for cross-national comparative analysis can help identify commonalities and differences, contributing to the development of a more universally applicable evaluation system."

Q3. **The response effectively addresses the reviewer's concern about methodological rigor but could slightly enhance the justification for expert selection.**

Reply: We appreciate the expert’s suggestion. In the METHODS section (page 8, line 203), we have enhanced the rationale for expert selection by incorporating descriptions of the selected experts' practical experience to ensure the representativeness of the expert panel. Additionally, in the RESULTS section (page 11, line 276), we have included descriptions of the experts' work experience.

The revised content is as follows:

"Therefore, the experts selected for this study should have professional backgrounds in emergency management, infectious disease management, and hospital informatization. Additionally, they should possess extensive practical experience in infectious disease prevention and control."

"All 32 experts have extensive experience in infectious disease prevention and control."