# Physicians' Referral Preferences towards Hospital-at-Home (HaH) Care Model: A Discrete Choice Experiment

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## Introduction

Hospital-at-Home (HaH) has emerged as an effective alternative to inpatient care, yet its adoption remains highly dependent on physician referrals. In practice, referrals to HaH begin with physicians determining whether a patient requires hospital admission or continued inpatient care, and whether their clinical condition meets the eligibility criteria for HaH. Despite physicians serving as the key gateway to HaH access, little is known about how they make referral decisions or balance competing patient, caregiver, operational, and health system considerations. Quantifying these trade-offs is essential for identifying implementation priorities and informing strategies to scale up HaH.

## Aim / Objective

This study explores how physicians make referral decisions when acute hospital care is delivered at home, examining how contextual and social uncertainties shape willingness to refer patients to HaH.




## Methods

A **two-stage discrete choice experiment (DCE)** was conducted nationwide in Singapore among physicians working in emergency departments and adult medical specialties in public acute hospitals across three healthcare clusters between December 2025 and February 2026. The DCE design was informed by findings from qualitative interviews with physicians. **Five salient factors** were selected that can be traded off and vary across cases when physicians make HaH referral decisions. Referral turnaround time (2, 4 or 6 hours) functions as an implicit non-monetary cost in physicians' decision-making. The DCE attributes span multiple levels of the healthcare system, encompassing patient factor (functional status), family and home support (caregiver capacity), patient preparedness (HaH awareness), organisational processes (referral turnaround time), and broader health system context (hospital capacity pressure).

Each participant was randomly assigned one of the 20 DCE questionnaire sets, with each set containing six DCE questions including one dominance fixed task. Participants were asked to choose between two hypothetical scenarios varying by five attributes, followed by a question asking whether they would refer the patient to HaH in their routine clinical practice under each chosen scenario.

**Figure 1. Sample of DCE choice task**

| | Scenario A | Scenario B |
|---|---|---|
| **Patient Functional Status** | ADL independent | ADL with minimum assistance |
| **Patient Care and Support** | Low-ability caregiver | No caregiver |
| **Patient Awareness of HaH** | Unaware of HaH | Unaware of HaH |
| **Current Hospital Capacity Pressure** | Low pressure | High pressure |
| **Referral Turnaround Time** | 4 hours | 2 hours |

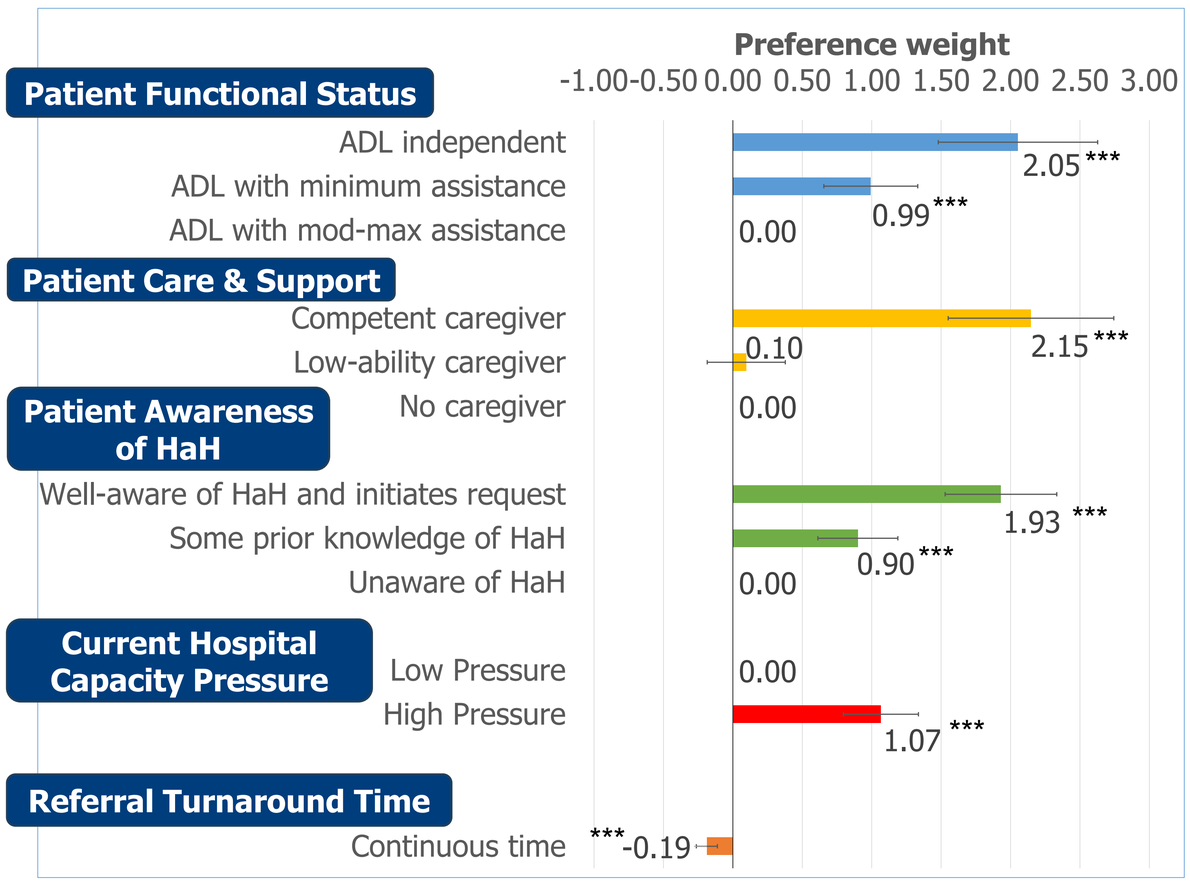
A **mixed logit model** was used for analysis. The model estimated preference (or utility) weights for each attribute level. Coefficients represent the direction and strength of preference (positive = more likely chosen; negative = less likely), and random coefficients (standard deviation) capture heterogeneity across clinicians. Normalised conditional relative importance was calculated. Willingness-to-accept time burden was calculated as

$$-\frac{\beta_{attribute}}{\beta_{referral\ turnaround\ time}}$$

## Results

A total of 335 participants were included in the analysis.

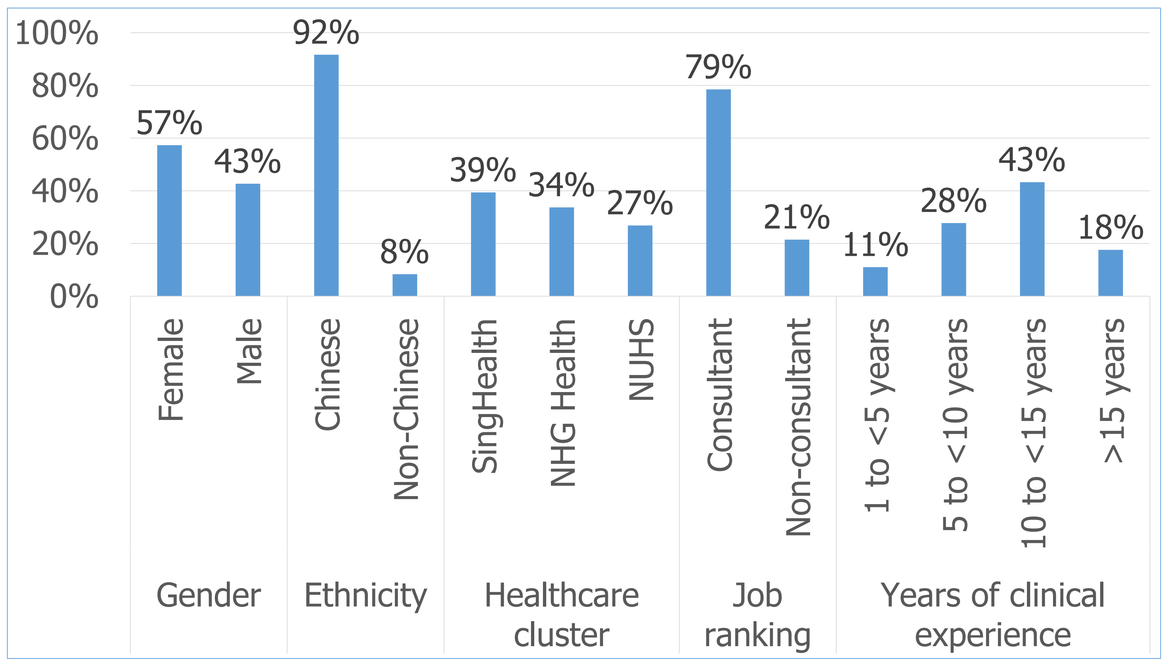
**Figure 2. Mixed logit model results**




Note: ADL= independence in activities of daily living; mod-max= moderate to maximal; zero coefficient indicates reference level; ***, p<0.001

- All attributes significantly influenced physicians' HaH referral decisions, with patient-level factors – care/support (27%), functional status (26%), HaH awareness (24%) outweighing hospital strain (13%) and referral turnaround time (9%).
- Substantial preference heterogeneity was observed across physicians in their willingness to refer patient to HaH (SD= 2.0) and in how they value the presence of a competent caregiver (SD= 1.2); p<0.001.
- Physicians were willing to tolerate longer referral turnaround times for ideal HaH patients (between 10 to 11 hours) than under high hospital capacity pressure (≈6 hours).
- The predicted probability of HaH referral uptake was 83% under baseline conditions, increasing to nearly 100% when patient exhibits an "ideal" HaH profile, defined by the highest-utility attribute levels of patient-level factors.

**Figure 3. Participant characteristics**




## Conclusions

- Physician referral decisions are primarily driven by **patient suitability**, suggesting that **improving patient readiness and homecare support structures are important** when encouraging HaH adoption among physicians.
- Embedding decision support tools in clinical workflow may improve consistency in referral decisions. Standardising caregiver capability assessments, providing additional support mechanisms for families, or reducing reliance on informal caregivers through HaH service redesign, may help reduce unwarranted variation in referrals.

**Future research** could identify what drives patient and family readiness for HaH and evaluate which implementation strategies best strengthen readiness, caregiver capacity, and homecare support—and whether these changes increase HaH referral rates. **Policy interventions** could prioritise improving public awareness and strengthening system-level integration by expanding social and community support services that reduce uncertainty for patients and caregivers at home.

**Physicians are not resistant to Hospital-at-Home; they are managing uncertainty.** Patient readiness appears to strengthen physicians' decision confidence, making them more willing to tolerate longer referral turnaround times.

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