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STUDY SYNOPSIS (Maximum 1500 words)

TITLE	How do Hospital in the Home (HITH) Units compare across Australia?
PRINCIPAL INVESTIGATOR, AFFILIATIONS AND CONTACT DETAILS	Dr Iftah Amith FRACGP AFRACMA CHIA (HITH Consultant) HITH Society Australasia Board Member Monash University
ASSOCIATE INVESTIGATORS AND AFFILIATIONS	A/Prof Benjamin Rogers – Associate Investigator (HITH Consultant/ID) Monash Health Monash University Dr Ru Hui New – Associate Investigator (General Medicine/Endocrinology) Dr Jenny Hutchison – Associate Investigator (Physician Trainee) Dr Evie Watts – Associate Investigator (Physician Trainee) Dr Ru Hui New will support recruitment and provide critical insights into how HITH services interface with general medical practice, ensuring the study's relevance to IMSANZ members.
IS THIS STUDY CURRENTLY A MULTICENTRE STUDY? (I.E. INVOLVEMENT OF MORE THAN ONE HEALTH SERVICES OR JURISDICTION)	YES NO This study involves participation from multiple HITH units across different jurisdictions in Australia.
ARE YOU LOOKING FOR OPPORTUNITIES FOR MULTICENTRE COLLABORATION?	YES NO Interested collaborators can contact the Principal Investigator directly.
IF 'YES' TO QUESTION ABOVE, CAN INTERESTED COLLABORATORS CONTACT YOU DIRECTLY?	YES NO Dr Iftah Amith Email: iftah.amith@hithsociety.org.au
BACKGROUND	Hospital in the Home (HITH) has become a pivotal component of Australia's healthcare system, providing hospital-level care in the comfort of patients' homes. This model has demonstrated numerous benefits,

	<p>including reduced hospital stays, fewer complications, faster recovery times, and enhanced patient satisfaction[1][2]. Beyond these patient-centred advantages, HITH alleviates strain on inpatient resources, addressing critical challenges such as bed shortages and extended emergency department wait times[3].</p> <p>Despite its widespread adoption and clear benefits, significant variability exists in how HITH services are structured and delivered across Australia. Differences in service models, staffing levels, patient demographics, and geographic reach contribute to challenges in defining what constitutes a HITH service. This lack of standardisation creates ambiguity, particularly in distinguishing HITH from other forms of ambulatory care.</p> <p>Efforts to clarify the scope of HITH services, such as the recent definition by the HITH Society of Australasia, have provided foundational guidance [4]. However, the operational nuances of these services remain largely undocumented. Current data sources, such as Diagnosis Related Groups (DRGs), are limited in their ability to capture the specialised and multidisciplinary nature of HITH care [5]. Additionally, little is known about how HITH services function in rural and remote settings, where they are vital in addressing healthcare inequities for Indigenous and underserved populations.</p> <p>This study seeks to fill these knowledge gaps by systematically benchmarking HITH services across Australia. By defining operational characteristics—such as patient volumes, staffing, care delivery settings, and technology use—this research will provide a comprehensive understanding of HITH services nationwide. Furthermore, by comparing these characteristics across regions and service types, the study will identify trends, disparities, and opportunities for improvement, ensuring that HITH services can continue to meet the evolving needs of Australia's healthcare landscape.</p>
<p>RESEARCH QUESTION/HYPOTHESES</p>	<p><u>Primary Research Question:</u> What are the operational characteristics of Hospital in the Home (HITH) services across Australia?</p> <p><u>Secondary Research Question:</u> How do these operational characteristics differ by service type and geographic location?</p> <p>Objectives:</p> <ul style="list-style-type: none"> • To define and document the operational characteristics of HITH services, including service delivery models, staffing patterns, patient volumes, and geographic reach. • To compare and identify differences in HITH operational characteristics across service types and geographic locations. <p>Primary Hypothesis:</p> <ul style="list-style-type: none"> • Null Hypothesis (H0): There are no consistent operational characteristics defining HITH services across Australia.

	<ul style="list-style-type: none"> Alternative Hypothesis (H1): There are consistent operational characteristics defining HITH services across Australia. <p>Secondary Hypothesis:</p> <ul style="list-style-type: none"> Null Hypothesis (H0): There are no significant differences in operational characteristics based on service type and geographic location. Alternative Hypothesis (H1): Significant differences exist in operational characteristics based on service type and geographic location. <p>Other Questions to Consider:</p> <ul style="list-style-type: none"> What are the key operational characteristics of HITH services across Australia, including patient volumes, staffing models, and care delivery settings? How do operational characteristics vary by service type (e.g., acute care, geriatrics, paediatrics)? What differences exist in HITH services across metropolitan, regional, rural, and remote locations? How are technologies and external resources (e.g., brokered nursing services) integrated into HITH service delivery, and do these vary by region? <p>This study will provide a comprehensive overview of the current state of HITH services across Australia and identify trends and variations that can guide benchmarking efforts, resource allocation, and future policy development.</p>
<p>PRIMARY OUTCOME/PROCESS MEASURE</p>	<p>The primary outcome of this study is to define and document the operational characteristics of Hospital in the Home (HITH) services across Australia. This includes benchmarking service delivery models, staffing patterns, and geographic reach to create a comprehensive profile of the current state of HITH services.</p> <p>Key metrics include:</p> <ol style="list-style-type: none"> Service Delivery Characteristics: <ul style="list-style-type: none"> Total patient separations during August 2024, categorised as: <ul style="list-style-type: none"> Same-day admissions. Multi-day admissions, further divided by demographics (adults, paediatrics, neonates). Average daily service size (number of patients under HITH care on any given day). Maximum number of visits to the same patient residence within a 24-hour period. Geographic Reach and Accessibility: <ul style="list-style-type: none"> Distribution of HITH services across states and territories. Geographic classification of care locations using the Modified Monash Model (metropolitan, regional, rural, remote). Service Models and Governance: <ul style="list-style-type: none"> Locations where care is delivered, including: <ul style="list-style-type: none"> Patients' homes. Dedicated HITH clinics.

	<ul style="list-style-type: none"> ○ Hospital-based facilities (e.g., inpatient wards, emergency departments). ● Governance models for patient care, such as: <ul style="list-style-type: none"> ○ HITH-led medical teams. ○ Hybrid models involving referring doctors or external providers. <p>Staffing and Resource Allocation:</p> <ul style="list-style-type: none"> ● Full-Time Equivalent (FTE) allocations for: <ul style="list-style-type: none"> ○ Nursing staff. ○ Medical Staff ○ Allied Health Staff ○ Pharmacist Staff ● Vacancies in key roles during August 2024. <p>Technology Utilisation:</p> <ul style="list-style-type: none"> ● Proportion of services using specialised technologies, including: ● Continuous ambulatory delivery devices (CADD). ● Mobile imaging tools (e.g., x-ray, ultrasound). ● Remote patient monitoring systems. ● Video telehealth services for urgent care. <p>This data will establish a clear baseline of operational characteristics and provide insights into the current capabilities and capacities of HITH services across Australia.</p>
<p>SECONDARY OUTCOME/PROCESS MEASURES</p>	<p>The secondary outcomes aim to compare the operational characteristics of Hospital in the Home (HITH) services across Australia, focusing on differences by service type and geographic location. These measures will explore variations in care delivery, staffing, resource utilisation, and technology adoption, highlighting disparities and trends that influence HITH service performance.</p> <p>Key measures include:</p> <ol style="list-style-type: none"> 1. Regional and Geographic Variations: <ul style="list-style-type: none"> ● Patient Volumes: Differences in the total patient separations (same-day and multi-day) and average daily service size across metropolitan, regional, rural, and remote areas. ● Service Capacity: Variability in the maximum number of patient visits accommodated within a 24-hour period across different geographic regions. ● Accessibility: Examination of care delivery locations (e.g., patient homes, clinics, hospitals) and their alignment with patient needs in rural and remote areas compared to metropolitan centres. 2. Service Type Differences: <ul style="list-style-type: none"> ● Patient Demographics: Analysis of service types (e.g., acute care, geriatrics, paediatrics, oncology) and how they influence operational metrics like patient separations and care settings.

	<ul style="list-style-type: none"> • Governance Models: Variations in governance structures (e.g., HITH-led teams versus hybrid models) by service type and their impact on service delivery. <ol style="list-style-type: none"> 3. Care Delivery Settings and Modalities: <ul style="list-style-type: none"> • Face-to-Face Care: Differences in the proportion of care delivered in patients' homes versus clinics, hospitals, or other facilities, analysed by service type and geographic region. • Preferred Locations: Variations in the percentage of face-to-face reviews conducted in patients' preferred locations (e.g., homes) across regions and service types. 4. External Resource Utilisation: <ul style="list-style-type: none"> • Brokered Services: Differences in reliance on external nursing providers for face-to-face care between metropolitan and rural services. • Regional Dependencies: Analysis of how reliance on external resources varies based on geographic location and service type. 5. Technology Adoption: <ul style="list-style-type: none"> • Regional Trends: Differences in the adoption of specialised technologies (e.g., mobile imaging, telehealth, remote monitoring) across regions. • Service-Specific Usage: How service types utilise technologies to enhance care delivery, with a focus on underutilisation in rural or specialised services. 6. Staffing and Resource Allocation: <ul style="list-style-type: none"> • Staffing Levels: Regional and service-type comparisons of Full-Time Equivalent (FTE) allocations for nursing, junior medical staff, registrars, and senior medical staff. • Staffing Specialisation: Distribution of medical specialties (e.g., general physicians, infectious disease specialists) by service type and region. • Workforce Shortages: Identification of geographic and service-specific trends in vacancies and unfilled roles. 7. Referral and Admission Patterns: <ul style="list-style-type: none"> • Regional Referrals: Differences in average daily referrals across geographic locations, highlighting potential disparities in demand. • Service Type Comparisons: Variations in non-admission rates by service type and geographic region, reflecting differences in referral patterns and capacity.
<p>STUDY DESIGN (IF THE STUDY IS A CLINICAL TRIAL, PLEASE INCLUDE INFORMATION ON SAMPLE SIZE CALCULATION, RANDOMISATION, AND BLINDING)</p>	<p>This is a multi-site observational study designed to benchmark the operational characteristics of Hospital in the Home (HITH) services across Australia. Using a standardised survey, the study will collect detailed data to describe and compare service delivery models, staffing, resource utilisation, geographic reach, and technology adoption.</p> <p><u>Scope of Study</u> The study will define the operational characteristics of HITH services, focusing on:</p> <ul style="list-style-type: none"> • Patient volumes and service capacity. • Staffing models and governance structures.

	<ul style="list-style-type: none"> • Geographic distribution and care delivery settings. • Utilisation of technology and external resources. <p>Comparative analyses will identify differences across service types (e.g., acute care, geriatrics, paediatrics) and geographic locations (e.g., metropolitan, regional, rural, remote).</p> <p><u>Methodology</u></p> <ol style="list-style-type: none"> 1. Recruitment: <ul style="list-style-type: none"> • Recruitment will be conducted through multiple channels to ensure comprehensive representation: <ul style="list-style-type: none"> ○ Communication via the HITH Society Australasia’s official channels as well as other organisations. ○ Direct outreach by the research team to HITH units across public and private sectors in Australia. ○ Promotion of the study at the HITH Society Australasia November Conference 2024. • Targeted recruitment will ensure participation from HITH services in metropolitan, regional, rural, and remote areas. 2. Survey Tool: <ul style="list-style-type: none"> • A structured, standardised survey will collect data on: <ul style="list-style-type: none"> ○ Patient volumes (e.g., same-day and multi-day separations, daily service size). ○ Staffing allocations (Full-Time Equivalent [FTE]) for nursing, medical, and allied health roles. ○ Geographic distribution of care delivery (e.g., metropolitan, regional, rural, remote classifications). ○ Care delivery settings (e.g., home-based care, clinics, hospitals). ○ Technology use (e.g., telehealth, mobile imaging, remote monitoring). ○ External resource utilisation (e.g., brokered nursing services). 3. Data Collection: <ul style="list-style-type: none"> • The survey will be completed by HITH clinical and operational staff. • Responses will be collected using REDCap, a secure and validated web-based data management platform. 4. Ethics and Confidentiality: <ul style="list-style-type: none"> • Ethics approval has been obtained from Monash Health Human Research Ethics Committee (Reference Number: RES-24-0000-084Q). • All collected data will be fully de-identified to maintain participant confidentiality. 5. Data Validation: <ul style="list-style-type: none"> • Survey responses will undergo validation checks to ensure accuracy and completeness prior to analysis.
INCLUSION CRITERIA	<p><u>Eligible Services:</u> All self-identified Hospital in the Home (HITH) services operating in Australia.</p>

	<p>Services that provide hospital-level care in patients' homes or alternative settings, including acute, subacute, or specialised care (e.g., geriatrics, paediatrics, oncology).</p> <p><u>Operational Scope:</u> Services that manage admitted patients under HITH models, regardless of size or organisational structure. Both public and private sector HITH services.</p> <p><u>Participation Requirements:</u> Willingness to complete the standardised survey, providing operational data on staffing, patient volumes, care delivery, and resource utilisation. Participation from clinical and/or operational staff familiar with the HITH service's day-to-day operations.</p>
EXCLUSION CRITERIA	<p><u>Ineligible Services:</u> Services that do not identify as Hospital in the Home (HITH). Services that do not provide hospital-level care in patients' homes or alternative settings (e.g., community health or outpatient clinics not meeting the HITH definition).</p> <p><u>Geographic Scope:</u> Services operating outside of Australia.</p> <p><u>Operational Scope:</u> Services unable to provide the necessary operational data through the standardised survey due to lack of access to or knowledge of required metrics.</p>
EXPECTED NUMBER OF PARTICIPANTS	<p>The study aims to recruit 50–100 HITH services from across Australia.</p> <p>Participation will include both public and private sector HITH services from all Australian states and territories. Efforts will ensure representation from metropolitan, regional, rural, and remote areas to capture the diversity of HITH operations. Based on previous engagement with HITH services through the HITH Society Australasia, this target is realistic and achievable within the proposed timeline. This expected participant pool will ensure sufficient data to define and compare operational characteristics across regions and service types, enabling meaningful benchmarking of HITH services nationwide.</p>
STUDY DURATION	<p>The study will be conducted over a period of 6 months, with the following timeline:</p> <ol style="list-style-type: none"> 1. Recruitment and Promotion: October–December 2024 Recruitment will occur via the HITH Society Australasia channels, direct outreach to HITH units, and advertising at the HITH Society Australasia November Conference. 2. Data Collection: October 2024–January 2025 Participating HITH services will complete the standardised survey, with responses submitted via REDCap. 3. Data Analysis: February–March 2025

	<p>Data will be analysed to define and compare operational characteristics, using both descriptive and comparative statistical methods.</p> <p>4. Reporting and Dissemination: April 2025 Results will be compiled into a final report and shared through HITH Society Australasia channels and other relevant forums.</p>
ANALYSIS	<ol style="list-style-type: none"> 1. Primary Analysis: <ul style="list-style-type: none"> • Descriptive statistics will summarise operational characteristics, including patient volumes, geographic reach, and staffing models. 2. Secondary Analysis: <ul style="list-style-type: none"> • Comparative analyses will identify variations in service delivery models, staffing, and technology utilisation by: <ul style="list-style-type: none"> • Service type (e.g., acute care, geriatrics, paediatrics). • Geographic location (e.g., metropolitan, regional, rural, remote). • Statistical tests, such as chi-squared tests and ANOVA, will be applied to evaluate differences and trends. 3. Reporting: <ul style="list-style-type: none"> • Aggregated results will highlight key benchmarking insights and regional trends across HITH services.
IMPORTANCE TO GENERAL MEDICINE	<p>Hospital in the Home services are a critical extension of general medicine, providing hospital-level care in patients' homes while reducing pressure on inpatient wards. This study is highly relevant to general medicine for the following reasons:</p> <ol style="list-style-type: none"> 1. Integration with General Medicine: <p>HITH services frequently manage patients under the care of general physicians, ensuring continuity of care for complex, multi-morbid cases. This study will benchmark how these services integrate with hospital-based general medicine teams.</p> 2. Improved Understanding of Service Delivery: <p>By defining the operational characteristics of HITH services, this study will provide general physicians with valuable insights into the scope and capacity of these services. This knowledge supports more informed referrals, better communication, and coordinated care for patients transitioning between hospital and home.</p> 3. Highlighting Regional and Service-Type Variations: <p>Understanding how HITH services differ across regions and service types will help general physicians tailor their interactions and expectations when collaborating with these services, particularly in underserved or rural areas.</p> 4. Informing Best Practices and Policy: <p>The study's findings will identify trends, disparities, and opportunities for improvement, supporting evidence-based policy and resource</p>

	<p>allocation. General physicians will benefit from enhanced care pathways and more efficient use of HITH services.</p> <p>5. Support for Equitable Care Delivery:</p> <p>Addressing inequities in HITH service availability, particularly for vulnerable and Indigenous populations, aligns with the broader goals of general medicine to provide equitable, high-quality care.</p> <p>By providing a comprehensive overview of HITH operations and highlighting areas for improvement, this study directly contributes to the goals of general medicine to optimise patient outcomes, improve resource utilisation, and enhance continuity of care.</p>
FUNDING	<p>This study is not currently funded. The research team is conducting this project with support from the HITH Society Australasia, which provides communication channels for recruitment and promotion of the study. The research team is leveraging institutional resources, such as REDCap for data collection and management, to minimise costs.</p> <p>No external financial support or grants have been sought or received at this time.</p>
HAS CONSIDERATION BEEN GIVEN TO HOW THIS PROJECT MIGHT IMPROVE EQUITY IN INDIGENOUS OR VULNERABLE POPULATIONS? PLEASE PROVIDE EXPLANATION	<p>Yes, this project explicitly considers equity by including data collection on geographic reach and service accessibility, particularly in rural and remote areas where Indigenous and vulnerable populations are often overrepresented. Key considerations include:</p> <ol style="list-style-type: none"> 1. Geographic Inclusion: <p>The study ensures representation of HITH services from metropolitan, regional, rural, and remote areas. This geographic scope captures disparities in service availability and resource allocation, which can disproportionately affect vulnerable populations.</p> 2. Data Insights on Accessibility: <p>The survey collects data on care delivery settings (e.g., home-based care, clinics) and geographic distribution, enabling an analysis of how HITH services cater to populations in underserved areas, including Indigenous communities.</p> 3. Highlighting Gaps: <p>The benchmarking process will identify areas where services are lacking or limited, particularly in regions with higher proportions of vulnerable populations. This information can guide future resource allocation and policy development to address inequities.</p> 4. Advocating for Equity: <p>By providing a comprehensive overview of HITH operations across Australia, the study will highlight inequities in access, staffing, and resource utilisation. These findings can inform targeted strategies to improve service delivery for Indigenous and vulnerable populations.</p>
CURRENT PROGRESS	<p>Design and protocol development [X] Ethics application [X] Study in progress [X]</p>

	Manuscript write-up in progress or under review <input type="checkbox"/> Accepted or published <input type="checkbox"/> Aborted
IMSANZ-RN OFFICE USE ONLY	ENDORSED NOT ENDORSED

1) Caplan GA, Sulaiman NS, Mangin DA, Aimonino Ricauda N, Wilson AD, Barclay L. A meta-analysis of "hospital in the home." *The Medical Journal of Australia* [Internet]. 2012 Nov 5 [cited 2019 Sep 20];197(9):512–9. Available from:

<https://www.mja.com.au/journal/2012/197/9/meta-analysis-hospital-home>

2) Caplan GA. Does 'Hospital in the Home' treatment prevent delirium? *Aging Health* 2008; **4**: 69–74

3) Deloitte Access Economics. Economic analysis of Hospital in the Home (HITH). 2011. Available at: https://www.hithsociety.org.au/resources/Documents/AccessEconomics-Final_Report_HITH_310811.pdf

4) Hospital in the Home Society of Australasia. Position Statement: Definition of Hospital In The Home 2023. Available from: <https://www.hithsociety.org.au/resources/Documents/Definition/HITH%20Society%20of%20Australasia%20-%20Definition%20of%20HITH.pdf>

5) Montalto, M., McElduff, P. and Hardy, K. (2020), Home ward bound: features of hospital in the home use by major Australian hospitals, 2011–2017. *Med. J. Aust.*, 213: 22-27. <https://doi.org/10.5694/mja2.50599>