BMJ Open

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Journal:	*BMJ Open*
Manuscript ID	bmjopen-2021-059330
Article Type:	Protocol
Date Submitted by the Author:	07-Feb-2022
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Keywords:	Organisation of health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Organisational development < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Protocols & guidelines < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

Innovative models of care for the health facility of the future: a protocol for a mixed-methods study to elicit consumer and provider views

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Word count: 4580

ABSTRACT

Introduction: The delivery of healthcare is dramatically changing in the face of new and enhanced technologies, increasing social and economic burdens of ageing populations, and the prevalence of chronic disease. To address these growing challenges, governments and health services are increasingly emphasising healthcare delivery models that are flexible, person-centred, cost-effective and integrate hospital services more closely with primary healthcare and social services. In addition, such models increasingly embed consumer co-design and leverage digital technologies. Examples include clinical dashboards, decision support tools, telehealth and sophisticated medical records systems introduced into hospital workflows, to deliver care more seamlessly and continually improve their services.

Objectives: This paper provides a study protocol to describe a method to elicit consumer and healthcare provider needs and expectations for the development of innovative care models.

Methods and analysis: A mixed-methods study of consumer members' and health providers' needs and expectations. Data collection includes a short consumer- and provider-specific, demographic questionnaire (delivered during the recruitment process), facilitator-coordinated consultation workshops, and follow-up interviews. Data will be analysed thematically (qualitative) and statistically (quantitative).

Ethics and dissemination: The results will be actively disseminated through peer-reviewed journals, conference presentations and in a report to stakeholders. This study was reviewed and approved by the relevant Ethics Committee in New South Wales, Australia.

Strengths and limitations of this study

- The study will be the first of its kind to identify the key evidence-based, innovative models of health care, considering the benefits and implementation considerations for each model, as perceived by consumers and healthcare providers.
- The study design was developed in collaboration with the Local Health District where the health facility will be located.
- A key strength of the study is the use of mixed-methods and the triangulation of data from multiple sources.
- A key limitation of the study is that the structure of workshops focused on specific scenarios which may not be generalisable.

BACKGROUND

Around the world, the delivery of quality hospital care is transforming in response to the availability of new and enhanced technologies and increasing demand for care.[1] Challenges to extant healthcare systems include an increase in the proportion of older adults in the population[2-4] that will redirect the focus of health towards long-term and chronic care.[3] Increased demand on the healthcare system comes from multiple sources, including higher prevalence of chronic diseases such as obesity, kidney failure[5] and cognitive decline.[3] The shift to patient-centred healthcare models[3] will also have resource implications while aiming for improvements in patient and staff satisfaction and quality of care.[6] To address the growing challenges globally, health services and governments are experimenting with more cost-effective care alternatives often delivered outside hospitals walls,[7] prioritising greater consumer engagement[8 9] and investing in digitised care services.[10] Digital services allow care to be more personalised, integrated with existing models, and delivered remotely (e.g., telemedicine). In applying advanced technologies such as robotics, artificial intelligence (AI) and big data analytics into hospital workflows, architects of new care models are seeking to provide more seamless care and continual improvement in services.[4]

In 2018, Braithwaite and colleagues identified key trends shaping the health systems of the future: global demographic dynamics, work in creating sustainable health systems, evolving technologies such as genomics and AI, and new models of care. New models of care are emerging to meet new circumstances. For example, the COVID-19 global health pandemic in 2020 acted as a catalyst or trigger for change (e.g., rapid adoption of telehealth) that have been called for previously by those who suffer chronic conditions[11]. E-health, telehealth and virtual care models allowed patients to remain socially distant rather than having physical contact with the community and health services, simultaneously reducing the risk of the virus

spreading among patients and healthcare providers.[12] These innovative models take a novel approach to provide high quality and safe care in and out of hospital settings.[13]

In Australia, the New South Wales (NSW) government announced funding for a new health facility at Rouse Hill. The Western Sydney Local Health District (LHD) is planning the new health facility and is seeking innovative ways of delivering care that are more accessible, efficient, and effective for healthcare providers, funders and the population. In consultation with our research team, it was believed that there was an opportunity to create a different kind of facility – a modern and digitally-enabled capability. Seeking views from consumers and providers will ensure that the way the facility provides services is deeply connected to community needs.

The goal of this project is to provide a research-based approach to develop an innovative health facility and health service; one that delivers a high-quality care solution for the community rather than simply establishing more hospital beds, departments, units, and wards. Realising this vision will have far-reaching implications for the design and delivery of health services in the future. But to develop any new model for integrating community and hospital acute care and support services, we need to turn to the community and health care providers to understand their expectations and the healthcare needs that may be met by innovative models of care. While we are gaining data to inform the construction and design of a "hospital", we use the term "health facility" to reflect blue sky thinking and avoid being constrained by language that implies a large conglomeration of buildings and beds.

Identifying evidence-based models of care

Before eliciting consumers' and providers' needs and expectations, we needed to assess the evidence to identify candidate models of care. We therefore undertook a grey literature review to identify potential models of care, followed by an academic review of the international evidence supporting the efficacy of these models.

The grey literature review involved an advanced search using Google and included websites such as World Health Organization and Organization for Economic Co-operation and Development (OECD) using search terms such as "future hospital". Two reviewers completed a title and abstract screen and three reviewed the full-text documents. Eighty-five documents were included, comprising 55 reports, 17 online newspaper articles, 10 articles or bulletins from organisation websites, two online articles and an opinion piece. From this review, seven themes were deductively determined that were used to group innovative models of health care (see Table 1). Benefits, drawbacks, and past implementation of the models were also identified.

The Preferred reporting Items for Systematic Reviews (PRISMA) was used to guide the academic literature review to extract the evidence-based support for the models of care identified in the grey literature.[14] Search strings chosen from prevalence data of the focal community in the context of the models were applied to three academics databases (PsychINFO, Ovid MEDLINE, and CINAHL). For example, "virtual hospital" AND "cardiac arrest". Sixteen reviewers (eights pairs) completed a title and abstract screen and subsequently reviewed the full-text documents. Given the large numbers of papers resulting from the searches (i.e., over 200,000 results), the researchers confined the searches to review papers only. Sixty-one peer-reviewed, English language review studies with human subjects, dated 2016-2021, met the criteria for inclusion. This review will be reported separately.

Table 1: Seven evidence-based innovative models of care

Model	Description	Example
Consumer focused care	During planning, delivery, and evaluation, consumers, carers, and families are placed at the centre of care.	Individualised self-management support in early chronic kidney disease transition of care plan[5]
Ambulatory care and diagnostic hospitals	Non-admitted services, where patient care does not involve an overnight stay and usually involves diagnosis and treatment on the same day.	Same day joint arthroplasty[15]
Digital hospitals	Hospitals that make extensive use of new technologies to provide streamlined care, improve patient safety and care quality, and improve overall care cost effectiveness.	Machine learning algorithm for prediction of post-total hip arthroplasty complications[16]
Hospital in the home	Some or all of patient care and consultation which is typically delivered in the hospital settings is delivered to patients in their own home.	Early discharge hospital at home care for chronic obstructive airways disease managed by a community service[17]
Integrated care	Multidimensional needs of the patient are delivered in a coordinated manner by an interdisciplinary team or network of healthcare professionals	Orthogeriatric fracture service[18]

Virtual care	Patient care and consultation delivered through telephone or video communication.	Telehealth management in patients with heart failure[19]
Specialist hospitals and population specific care units	Specialist hospitals provide selective care services for targeted patient groups. Population-specific care units are pathways within general hospitals dedicated to treatment of specific conditions	Comprehensive cancer centres[20]

METHODS

Study Aim

The study aims to elicit health consumers' and healthcare providers' needs drawn from the local community and expectations of a new health facility, and how these needs may be met through the delivery of innovative models of care.

Study Design

We will conduct a mixed-methods study of consumer and provider needs and expectations in relation to innovative models of care delivery for a new health facility. As illustrated in Figure 1, the design comprises collections of consumer and provider data via a short expression of interest (EOI) questionnaire comprising demographic information (as part of the recruitment process), facilitator-coordinated workshops, and supplementary interviews. Data collection will occur in a sequential manner, where results from the EOI questionnaire will inform workshop design. In addition, interview design and recruitment will be informed by the learnings from the workshops. Together, these methods of data collection will facilitate a varied and dynamic exploration of community and provider needs and expectations for innovative models of healthcare (see Figure 1).

FIGURE 1 HERE

Study Setting

The project will be conducted online and in person. Specifically, the recruitment demographic questionnaire will be hosted and completed online. The face-to-face workshops will be held at public metropolitan hospitals and community centres in New South Wales (NSW), Australia. Participants will be provided with options to attend workshops during, or outside of working hours. For face-to-face workshops, we will follow all current COVID-19 guidelines that are current at the time of data collection (e.g., social distancing, wearing of masks). In addition, the meeting format will be adjustable to being video-enabled to respond to any face-to-face restrictions in place associated with the COVID-19 pandemic. Supplementary interviews with interested participants identified in the workshops will be conducted via an online platform such as Zoom or over the telephone for participant convenience.

The catchment area where a new health facility is currently being planned comprises a land area of almost 500 square kilometres and a population estimated in 2019 to be 300,000 residents estimated in 2019. Between the 2006 and 2016 population censuses, the catchment experienced a population growth rate of 29% and this growth rate was predicted to rise when assessed using the 2021 census data.[21 22] The 2016 Census reported that adults aged 35-44 years and school aged children aged 5-9 years were the largest age groups, 37% of the population was born outside Australia and 0.9% identified as Aboriginal and/or Torres Strait Islander.[23]

Procedures

Recruitment:

Consumer members will include residents and patient representatives within the new health facility catchment (49 suburbs) as defined by the LHD's planning team on 16th July 2021. The participants will be recruited through the LHD's network and connections via email, postings in local newspapers and through Facebook invitations. For providers, emails will be sent by the LHD to potential participating providers such as healthcare professionals and support staff, and community members via their established connections. These connections include, but are not limited to, consumer networks, LHD community newsletters, migrant resources centres, the Primary Health Network, and the Youth Advisory Council. To reach potential consumer participants who may not have access to email or the internet, the invitation will also be posted in local newspapers and advertised as flyers at LHD hospitals. For providers, emails will be distributed via the LHD's Broadcast system, the Primary Health Network, and from the Chief Executive Officer.

As 37% of the consumers are from culturally and linguistically diverse (CALD) backgrounds, non-English speaking participants will invited to participate in the study, aided by bi-lingual interpreters from the LHD. The research materials comprising the invitation, EOI questionnaire, workshop and interview scripts will be translated into the five most prevalent non-English languages in the community - Hindi, Punjabi, Mandarin, Korean and Arabic.

For those accessing the research invitation electronically (via email or Facebook advertisements), the invitation will include a link to an online EOI questionnaire using REDCap electronic data capture tools.[24] The questionnaire will collect demographic data including age, gender, location, ethnicity and contact information. The providers will be asked to indicate their role and specialty, and the consumers will be asked for pertinent health information such as whether they have a chronic health condition. Responses to the questionnaire will be taken as implied consent for collection of the demographic information.

The provided contact information will be used to send the participant details about the location and time of the workshops (either via phone or email – as selected by the participant). For all participants who attend a workshop, we will ask for written informed consent prior to commencement of the workshop. Participants will be sent the Participant Information and Consent Form (PICF) prior to the workshop so that they can come prepared with questions for the research team. Once participants sign the consent form, the research staff will photocopy the PICF and provide a copy to each consenting participant. In the event of delivering the workshops online, a link will be sent to the participants for access to the PICF presented using REDCap tools.[24]

Interview participants will be recruited following the workshops. After each workshop, those who express interest will be contacted for a follow-up interview to confirm the findings. The PICF for the workshop informs participants that they may be contacted after the workshop to be invited to a follow-up interview. Figure 2 provides a map of the recruitment process for consumers and providers.

INSERT FIGURE 2 HERE

Workshops:

There will be a total of 16 workshops across two streams of eight: one stream for health providers and another for consumer members. Each workshop has been designed to elicit responses to the seven models of care. To do this, we will divide participants into smaller parallel groups that each will examine three models of care in detail, rather than present all seven models and induce fatigue. The models have been counterbalanced across the eight workshops, to ensure that the presentation and order of each model is balanced. There will be up to eight facilitators and scribes at each workshop (a facilitator and scribe per group). Where needed, some groups within the workshops will be supported by bi-lingual

interpreters. The number of participants in each workshop group has been designed based on our collective research experience as an appropriate number for elicitation of the data we are seeking and is consistent with the number of participants in focus groups where people feel relatively comfortable speaking to others.[25]

The workshops will start with a short explanation by a research team lead, explaining that the purpose of the workshop is to capture the needs of the consumers or providers and their perspectives on innovative models of care delivery. They will then allocate the researchers and participants to the groups. Within each group, the researchers will take notes, facilitate discussion, and ask probing questions. Audio-recording devices, and researcher notes will be used to capture the content of discussions.

After a brief icebreaker activity, the researchers will then ask questions to probe the participants' digital literacy (e.g., "How comfortable are you using a smart phone/smart watch/computer?"). Workshop scenarios and questions have been designed around the seven innovative models of care identified in the literature review (Table 1). The priority conditions used in the scenarios have been identified from the demographic data provided by the LHD as the most common burdens of disease in the new health facility catchment and are listed below:

1. Cardiac arrest, chest pain, acute myocardial infarction, congestive heart failure.
2. Fractures, knee replacement, hip replacement, joint replacement, abnormal gait, bone disease, osteoporosis.
3. Abdominal pain, pelvic pain, gastrointestinal pain.
4. Pneumonia, asthma, chronic obstructive pulmonary disease.
5. Postnatal depression.
6. Dialysis (haemodialysis etc.), kidney disease, end stage kidney disease.

Scenarios will be presented to participants for each model of care (see Table 2). Three of the seven models along with the scenarios will be presented in each workshop.

Table 2: Models of care and scenarios

Model	**Scenario**
Ambulatory care and diagnostic hospitals	"Maria is a 45 year old woman who is able to walk unaided and travels to a centre for treatment 2-3 times per week (e.g., renal dialysis in a shopping centre, or chemotherapy)."
Digital Hospital	**"**John is a 70-year-old man who has a heart condition that causes dizziness (e.g., irregular heartbeat). As this places him at a high risk of falls, he has been admitted to hospital for monitoring. Beside his bed is a digital matt that detects and alerts the staff if he has had a fall."
Hospital in the Home	**"**Jenny is a 35-year-old, single mother of three who developed a breast infection with an abscess following the birth of her baby. She was treated with intravenous antibiotics (on a drip) and a tube was placed into her breast to drain the infected fluid. After 24 hours, she returned home to her children and is provided wound care and support in her home from a visiting nurse."
Integrated Care	"Steve is a 50-year-old man with Type II diabetes who is obese and smokes a packet of cigarettes a day. He is having trouble walking so visits his local Emergency Department where he sees a General Practitioner (GP), who has a practice in an office next to the Emergency Department. The GP diagnoses a foot ulcer and identifies that Steve requires a full review of his care. Steve will be looked after in hospital by a

	multidisciplinary team of healthcare professionals (e.g., endocrinologist, ulcer team, nutritionist) using an electronic medical record system for communication."
Virtual /Consumer Focused Care	"Ivy is a 40-year-old woman who developed chest pain along with an irregular heartbeat following a dental procedure. She visited the local Emergency Department where no abnormality was found and was discharged. As she was still concerned about a sudden heart attack, she was fitted with a digital heart monitor with chest leads that talked to an application on her smart watch. Ivy was shown how to indicate an unusual heart event using her watch. Anytime Ivy tagged an event, the information was sent to a health care professional at the moment it happened."
Specialist hospitals and population specific care units:	"Harrold is an 82-year-old man with mild dementia, who develops a urinary tract infection. He has been referred to a specialist dementia unit in a geriatric care ward at the local hospital. Harrold and his family are reassured that he will receive the highest level of evidence-based care for dementia from a specialised team of health professionals."

Following the presentation of each scenario, we will ask general questions about the model's strengths and weaknesses, usability and safety for themselves and people in their care. For providers, we will ask them about barriers and enablers from their own and their patients' perspective, with respect to each model of care. At the end of each workshop, the participants will be asked to indicate their preferred model of care via a poll. Example facilitator scripts for the consumer and provider groups are provided in Supplementary File 1.

Each workshop will be planned for a two-hour duration with a five-minute break after the first hour. Each participant will be invited to participate in one workshop but will be offered a

series of dates to choose from. Participants will not be paid for their participation but those who attend in-person will be provided with refreshments.

Participants:

The consumer workshops will include residents of the new health facility catchment area. Provider workshops will comprise health providers that provide care or are likely to provide care, and stakeholders who make decisions about provision of care such as LHD executives and administrators, for the catchment population. In a first wave of data collection, we will recruit 15-30 participants for each of the workshops (this estimation takes into consideration participant loss to follow-up). Six workshops will result in approximately 120 health providers and 120 consumer member participants (240 participants in total). However, the number of participants invited to each workshop may be influenced by government mandated COVID-19 restrictions at the time of data collection. In a second wave, up to 40, non-English speaking, CALD participants will be recruited with the support of the LHD's Multicultural Health Team.

In parallel, there will be a third, but separate but aligned, wave of data collection, to include consultation with Aboriginal and Torres Strait Islander Elders. Consultation with these community members will involve a formal process of consultation with Aboriginal Liaison Officers in the LHD to develop an Aboriginal Health Impact Statement and associated ethics proposal. This consultation will be conducted in-person to ensure this is conducted in a culturally respectful manner as directed by the Aboriginal Liaison Officers in the LHD.

Inclusion criteria:

All participants will be 18 or older and will either have English language competence (written and spoken), or interpreter assisted non-English language (written and spoken), sufficient to provide verbal informed consent. The study is open to all community members, but we will also specifically seek to recruit participants representative of the six specific

health conditions/services by targeting recruitment of condition networks associated with these health conditions.

Those who currently provide care to those residing in the catchment for the new health facility, or who make decisions about provision of care for those residing in the catchment, are eligible to participate. This will include general practitioners and other health providers such as community nurses and services, allied healthcare professionals, aged care facilities, community care organisations, the primary health network, community care providers, the ambulance service, and other identified stakeholders. The inclusion criteria are broad enough to capture any health provider in the LHD or new health facility catchment, but we will also target participants whose work relates to patients in the six specific listed conditions or services.

Interviews:

Supplementary to the workshop, we will invite those participants who are key stakeholders but were unable to participate in the workshop, or those who indicate an interest during the workshops to participate in semi-structured interviews. The purpose of these interviews is to expand on areas of interest and verify the findings from the workshop data. Interviews will be audio-recorded and are expected to last approximately 45 minutes. The interview script commences with "For Model X, can you please elaborate on what you think is meant by the strengths/barriers/enablers/safety issues…", and is deliberately open ended to allow the participant to freely express their views. The interview script is provided in Supplementary file 2.

Data collection:

Participants' demographic information (e.g., age, gender) and health-relevant data will be collected through the EOI questionnaire. Consumers will be asked about their experiences using acute, chronic and outpatient services, their ethnicity, language spoken at home, and

residential postcode. Providers will be asked to indicate their role, specialty, whether they are employed by the LHD, and work postcode. In the case of workshops being delivered online, participants will be sent their information and consent forms to sign prior to attending.

The workshops and supplementary interviews will be run by a team of experienced health services researchers and will explore the experiences and views of participants with respect to innovative models of care. Responses will be audio recorded. Key themes and different points of view will be identified and recorded for qualitative analysis. Each group within a workshop will provide their written notes and observations to the workshop facilitator who will collate the data. The data will then be aggregated across all the workshops for analysis, separately for consumers and providers.

Planned data analyses:

The quantitative data that includes demographic and health related data from the EOI questionnaire will be analysed using SPSS V.22.0 and weighted against the Australian Bureau of Statistics data for the catchment, to assess representativeness of the sample.

Consumer and provider workshop and interview data for each model will be merged into two aggregated, narrative summaries, one for consumers and one for providers. All participants will be de-identified, and any identifiable features of the experiences or personal details shared in the group will be changed (e.g., if a unique service or practitioner is mentioned; or features of the disease which identifies the patient). Data collected in the focus groups and interviews will only be used for the purpose of this research project.

Aggregated data sets will be analysed separately for consumers and providers. Qualitative data (i.e., facilitator notes and key elements of the workshop recordings) will be thematically analysed independently using an open coding process by two members of the research team. Themes will be extracted that characterise the expectations and needs of the consumer members and health providers of the new health facility catchment. Data collection and

analysis will occur iteratively; questions used for workshops and guides for observations will be refined and expanded as new findings emerge.

Synthesising and integrating results:

Data will be synthesised using a triangulated approach, whereby literature review findings, community characteristics, and findings from the focus groups and interviews will be integrated to arrive at a set of evidence-based, community-and-provider-supported strategies for delivering care to those in the healthcare catchment. Figure 3 illustrates the data collection, analysis and synthesis strategy for the project. Triangulated findings will be used to inform planning options and feasibility of implementation of the options for development of the new health facility.

INSERT FIGURE 3 HERE

Patient and Public Involvement

No patient involved. No patient data is reported in this paper.

Discussion

This study seeks to examine consumer and provider needs and expectations for the development of an innovative care model for a health facility, specifically pertaining to seven evidence-based models of care and the health conditions that form major burdens of disease found in a diverse catchment area in metropolitan NSW, Australia. The study investigates community perspectives on each model of care in detail, each presented within a purpose-designed, contextualised health scenario. Healthcare delivery is changing due to the introduction of new and enhanced technologies, the increasing social and economic burdens of ageing populations, and the prevalence of chronic disease, amongst other factors. Therefore, it is important that we use these findings to guide the development of new

healthcare facilities to ensure that both consumer and provider needs are met. These findings may be used to inform policies on how to design new healthcare facilities in consideration of consumer and provider needs.

The limitations of this study may include the following factors. Due to the scope of the project, we cannot include an exhaustive list of health conditions. We have used a data-driven approach to stratify the main diseases reported in the new catchment as defined by the LHD. In addition, this study is limited to the local health district under investigation and the specific needs of the consumer and providers in that district. Finally, the catchment area could change as the LHD redefines its boundaries.

Expected outcomes

Adopting an evidence-based approach, we will elicit opinions from consumers and providers within the catchment of a new healthcare facility about the barriers and enablers pertaining to seven innovative models of care. This will provide a care model for future health facility development, in Australia and globally. Ultimately, the outcomes will help to ease the burdens that many health facilities face such as the increasing social and economic burdens of ageing populations, and the prevalence of chronic disease.

Ethics and Dissemination: There are no known health or safety risks associated with participation in any aspect of the described study. Ethics approval for conducting the study was obtained from the Local Health District Human Research Ethics Committee (2021/PID01000). The results will be actively disseminated through peer-reviewed journals, conference presentations and reports to stakeholders.

Contributors: GL, JB, RCW and PH conceptualised the study. AC, NR, CP, ZM, RCW, PH, KM and JB contributed to the design of the study. AC drafted the initial manuscript, assisted

by NR, CP, ZM, RCW, PH and JB. All authors contributed to the refinement of the paper and approved the final manuscript.

Acknowledgements: The authors wish to thank Natasia Seo, Anita Calderan and Chrissan Segaram for their advice, and assistance obtaining the demographic data for the health facility catchment area. The authors also wish to thank Monika Latanik and the Local Health District's Multicultural Unit for their assistance with CALD recruitment and interpretation services.

Data availability statement: No additional data available.

Funding: The study was funded by Health Infrastructure (NSW, Australia), as an independent consultancy to support a larger project developing and implementing a new health facility in Sydney, Australia. Grant number HI20314. The funder did not play a part in the design, conduct or reporting of this study.

Competing interests: Nil to declare

Disclaimer: The views expressed herein are the personal views of the authors and not necessarily those of Western Sydney Local Health District, Health Infrastructure, or the NSW Ministry of Health, and are not to be understood or quoted as being made on behalf of or reflecting the positions of those organisations.

Patient consent for publication: Participants will provide written consent in accordance with the HREC-approved Patient Information and Consent Form, which detailed how the findings would be disseminated. No patient data is reported in this paper.

Provenance and peer review: Not previously submitted or under consideration elsewhere.

Figure 1: Data collection points over time for consumer and provider groups.

Figure 2: Recruitment process map

Figure 3: Recruitment process and data plan for the project

References

1. Braithwaite J, Mannion R, Matsuyama Y, et al. Healthcare systems: future predictions for global care. Boca Raton, Florida: CRC Press 2018.

2. Amalberti R, Nicklin W, Braithwaite J. Preparing national health systems to cope with the impending tsunami of ageing and its associated complexities: Towards more sustainable health care. *Int J Qual Health Care* 2016;28(3):412-4. doi: 10.1093/intqhc/mzw021 [published Online First: 2016/03/17]

3. Braithwaite J, Mannion R, Matsuyama Y, et al. The future of health systems to 2030: a roadmap for global progress and sustainability. *Int J Qual Health Care* 2018;30(10):823-31.

4. Penno E, Gauld R. Change, Connectivity, and Challenge: Exploring the Role of Health Technology in Shaping Health Care for Aging Populations in Asia Pacific. *Health Syst Reform* 2017;3(3):224-35. doi: 10.1080/23288604.2017.1340927 [published Online First: 2017/07/03]

5. Havas K, Douglas C, Bonner A. Meeting patients where they are: improving outcomes in early chronic kidney disease with tailored self-management support (the CKD-SMS study). *BMC Nephrol* 2018;19(1):279. doi: 10.1186/s12882-018-1075-2 [published Online First: 2018/10/22]

6. Joseph A, Kirk Hamilton D. The Pebble Projects: coordinated evidence-based case studies. *Build Res Inf* 2008;36(2):129-45. doi: 10.1080/09613210701652344

7. Conley J, O'Brien CW, Leff BA, et al. Alternative strategies to inpatient hospitalization for acute medical conditions: a systematic review. *JAMA Internal Medicine* 2016;176(11):1693-702.

8. Chewning B, Bylund CL, Shah B, et al. Patient preferences for shared decisions: a systematic review. *Patient Educ Couns* 2012;86(1):9-18.

9. Frist WH. Connected health and the rise of the patient-consumer. *Health aff Web exclusive* 2014;33(2):191-93. doi: 10.1377/hlthaff.2013.1464

10. Khan A, Mir MS. Digital Hospitals. *Scholarly Journal of Biological Science* 2021;10(1):104-6.

11. Smith AC, Thomas E, Snoswell CL, et al. Telehealth for global emergencies: Implications for coronavirus disease 2019 (COVID-19). *J Telemed Telecare* 2020;26(5):309-13. doi: 10.1177/1357633X20916567 [published Online First: 2020/03/21]

12. Duffy S, Lee TH. In-person health care as option B. *N Engl J Med* 2018;378(2):104-06.

13. Lansisalmi H, Kivimaki M, Aalto P, et al. Innovation in healthcare: a systematic review of recent research. *Nurs Sci Q* 2006;19(1):66-72. doi: 10.1177/0894318405284129 [published Online First: 2006/01/13]

14. Moher D, Liberati A, Tetzlaff J, et al. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Medicine* 2009;6(7):e1000097.

15. Carey K, Morgan JR, Lin MY, et al. Patient Outcomes Following Total Joint Replacement Surgery: A Comparison of Hospitals and Ambulatory Surgery Centers. *J Arthroplasty* 2020;35(1):7-11. doi: 10.1016/j.arth.2019.08.041 [published Online First: 2019/09/19]

16. Shah AA, Devana SK, Lee C, et al. Development of a Novel, Potentially Universal Machine Learning Algorithm for Prediction of Complications After Total Hip Arthroplasty. *J Arthroplasty* 2021;36(5):1655-62 e1. doi: 10.1016/j.arth.2020.12.040 [published Online First: 2021/01/23]

17. Bal Özkaptan B, Kapucu S. Home nursing care with the self-care model improves self-efficacy of patients with chronic obstructive pulmonary disease. *Jpn J Nurs Sci* 2016;13(3):365-77.

18. Naranjo A, Fernandez-Conde S, Ojeda S, et al. Preventing future fractures: effectiveness of an orthogeriatric fracture liaison service compared to an outpatient fracture liaison service and the standard management in patients with hip fracture. *Arch Osteoporos* 2017;12(1):112. doi: 10.1007/s11657-017-0373-9 [published Online First: 2017/12/13]

19. Oliveira JAd, Cordeiro RG, Rocha RG, et al. Impact of telephone monitoring on patients with heart failure: a randomized clinical trial. *ACTA Paul Enferm* 2017;30(4):333-42. doi: 10.1590/1982-0194201700050

20. Grant SJ, Marthick M, Lacey J. Establishing an integrative oncology service in the Australian healthcare setting - the Chris O'Brien Lifehouse Hospital experience. *Support Care Cancer* 2019;27(6):2069-76. doi: 10.1007/s00520-018-4460-2 [published Online First: 2018/09/19]

21. Australian Bureau of Statistics: Australian Statistical Geography Standard (ASGS) 2021. https://www.abs.gov.au/websitedbs/d3310114.nsf/home/australian+statistical+geography+standard+(asgs) accessed 1 May 2021.

22. Australian Bureau of Statistics : 2016 Census. https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/2916.0main+features252016 accessed 1 May 2021 [Available from: https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/2916.0main+features252016.

23. Epidemiology and Health Analytics, Western Sydney Local Health District. Epidemiological Profile - Rouse Hill Catchment Area (RHCA) Residents. 2021. . Sydney: Western Sydney Local Health District, 2021.

24. Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform* 2009;42(2):377-81.

25. Bloor M. Focus groups in social research. London: UK: SAGE Publications 2001.

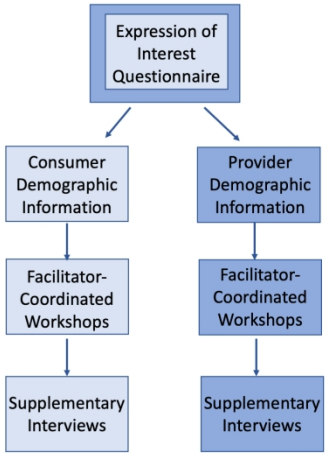

Figure 1: Data collection points over time for consumer and provider groups.

338x190mm (225 x 225 DPI)

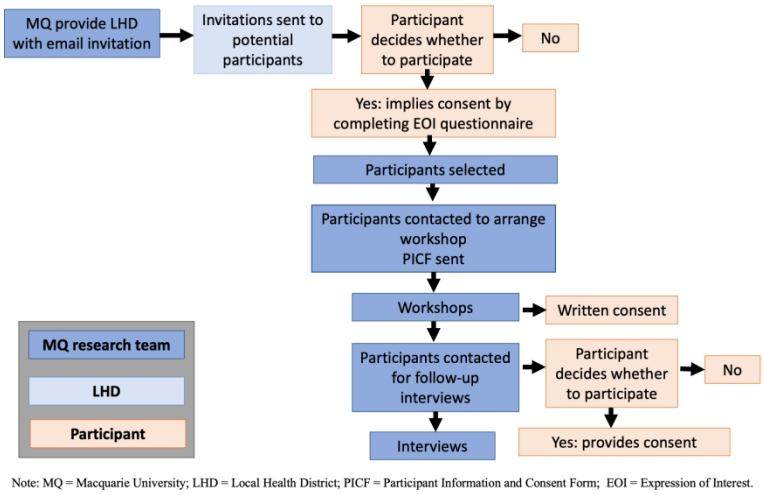

Figure 2: Recruitment process map

338x190mm (225 x 225 DPI)

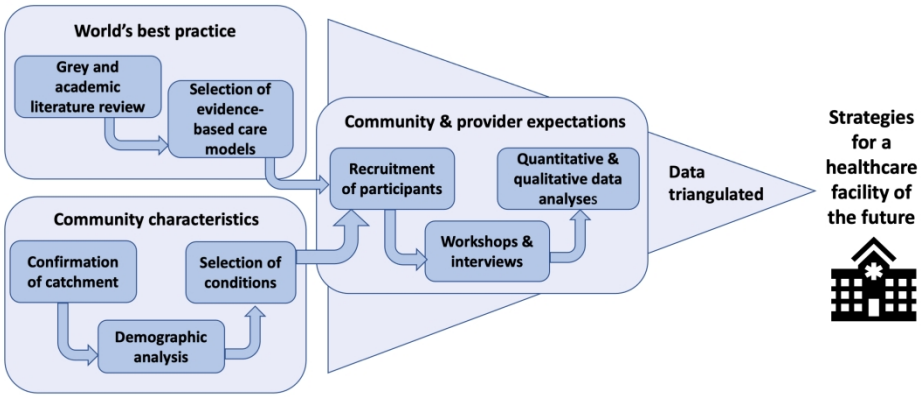

Figure 3: Recruitment process and data plan for the project

338x190mm (225 x 225 DPI)

Consumer: General Welcome

"Thank you for coming along today and participating in our study. My name is XXX.

Acknowledgement of Country

Bathrooms, fire exits.

The purpose of this workshop is to capture the needs of the Rouse Hill community and their perspectives on new ways of delivering acute care. What we talk about today will inform the development of the new hospital in Rouse Hill. We really appreciate your time and thank you very much for being here today.

Consumer stream: As consumers of healthcare, your experiences as patients are very valuable. However, please note that there is no obligation to disclose details of personal healthcare issues.

Throughout the workshop a researcher/facilitator will be with each table group to take notes, facilitate discussion and ask you questions. The workshop will go for 2 hours with a 10-minute break with refreshments after the first hour."

Audio-recording devices, flipcharts, and notes will be used to capture discussions. You will remain unidentifiable in the analysis and write-up of any findings relating to this research.

If you have any questions throughout the day, please ask one of the Macquarie University staff members (**introduce all staff members**).

Before we begin, we ask that your read and sign the PICF on your tables. If you have any questions before signing, now is the time to ask (**pause for questions**). Once you've signed, we will photocopy the documents and provide you with your own version."

Group Introduction

"Good afternoon (morning/evening etc.) and welcome to the workshop. Thanks for taking the time to talk with us about what you would like to see in the new Rouse Hill Hospital. My name is (**insert name here**), and I am from the Australian Institute of Health Innovation at Macquarie University. We are working in partnership with Health Infrastructure and the Western Sydney Local Health District. My role as moderator will be to guide the discussion today.

Please note that there are no right or wrong answers but rather differing points of view. Please feel free to share your point of view even if it differs from what others have said. You don't need to agree with others' opinions, but we ask that you listen respectfully as others share their views.

You've probably noticed the microphone. We are taping the session because we don't want to miss any of your comments. People often say very helpful things in these discussions, and we can't write fast enough to get them all down. However, to make the recording as clear as possible, we ask that only one person speak at a time. And to remind you, no-one is identifiable on the recording.

Let's get started! Before we begin, if you wouldn't mind writing your name on the (name card/sticker in front of you. We will be on a first name basis today, but we won't use any names in our reports."

Icebreaker Activity

"To get everyone thinking, we have planned a brief icebreaker activity. The purpose of this activity is to encourage thinking outside of the box.

- As a group, let's try to come up with 15 different ways that you can use a paperclip. The more inventive, the better. Who would like to start? We have 3 minutes!

(Separate sheet of paper)

Please rate on the scale below the following:

1. **How comfortable are you using:**

A smart phone?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

A smart watch?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

Computers?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

"Now that we have gotten to know each other a little better we would like you to reflect on a patient or patients who may or may not benefit from different "models of care". Today, we will talk about three different models of care in our workshop today. These are not the only models of care we are exploring, but we only have two hours, so will be talking about different models with different groups. We are interested in your ideas and would like you to reflect broadly as well as on

your experience as a person who may or may not benefit from these three different "models of care".

Model 1: Ambulatory Care and diagnostic hospitals: Non-admitted services, where patient care does not involve an overnight stay and usually involves diagnosis and treatment on the same day.

SHOW images: Home vs. Hospital (Images 1/2)
Maria (Image 3)

Your name is Maria and you are a 45 year old patient who is able to walk unaided and travels to a centre for treatment 2-3 times per week (e.g., renal dialysis in a shopping centre, chemotherapy)

We would like to ask questions from Maria's as well as your own perspective. Let's start with Maria:

From Maria's perspective:

1. **What is good about this model for Maria?**

2. **What about this model might make it difficult for Maria?**

Additional prompts

Can you think of anything about it that might be impractical?

Can you think of anything about it that might be unachievable?

3. **What needs to be in place for this to work for Maria?**

For example, systems, processes, people, skills and equipment?
Now from your perspective:

4. **What about this model might be good for you and your family?**

5. **What about this model might make it difficult for you and your family?**

Additional prompts

Can you think of anything about it that might be impractical?

Can you think of anything about it that might be unachievable?

6. **How easy is this to use for you?**

7. **What would stop you using it?**

8. **Can you think of other people who would have difficulty using this model?**

9. **We have already asked for Maria but what other things needs to be in place for this to work for you?**

   For example systems, processes, people, skills and equipment

General questions:

10. **Is there anything about the model that concerns you?**
11. **Can you see any safety issues for yourself?**
    - Why is that?
    - *Can you suggest a better way?*

(Additional prompts)

Are there any potential risks that you can identify?

12. **What other illness and injuries might this model work for?**

Model 2: Digital Hospitals/Consumer Focused Care

Hospitals that make extensive use of new technologies to provide streamlined care, improve patient safety and care quality, and improve overall care cost effectiveness.

SHOW images: Home vs. Hospital (Images 1/2)
John (Image 4)

John is an 70-year-old man who has a heart condition that causes dizziness (e.g., irregular heartbeat). As this places him at a high risk of falls, he has been admitted to hospital for monitoring. Beside his bed is a digital matt that detects and alerts the staff if he has had a fall.

Repeat questions

Model 3: Hospital in the Home

Patient care and consultation which is typically delivered in the hospital settings is delivered to patients in their own home (e.g., intravenous therapy (antibiotics), anticoagulation, wound care, and chemotherapy).

SHOW images: Home vs. Hospital (Images 1/2)
Jenny (Image 5)
Jenny is a 35-year-old, single mother of three who developed a breast infection with an abscess following the birth of her baby. She was treated with intravenous antibiotics (on a drip) and a tube was placed into her breast to drain the infected fluid. After 24 hours, she returned home to her children and is provided wound care and support in her home from a visiting nurse.

Repeat questions

At end of focus group

Concluding remarks: Now that we have come to the end of the workshop, we'd like to ask you:

How important is it for you to be able to choose a model of care?

Prompt: What if you have no option to choose? (only use if needed)

From your perspective, please rate your preference for each model: (Note: Models X, Y, and Z will be replaced with the relevant models discussed at each workshop).

Model X	No pref	Neither suitable	Model Y
Model Y	No pref	Neither suitable	Model Z
Model Z	No pref	Neither suitable	Model X

Is there anything else you would like to communicate to us about the new hospital?

Concluding remarks:

We will be looking at your data to find commonalties between consumers.

We are conducting exploratory research to gather information only, and all models may not be implemented. Thank you for your time.

Note: All images were publicly available and downloaded from Google.

Provider: General Welcome

"Thank you for coming along today and participating in our study. My name is XXX.

Acknowledgement of Country

Bathrooms, fire exits.

The purpose of this workshop is to capture the needs of the Rouse Hill community and their perspectives on new ways of delivering acute care. What we talk about today will inform the development of the new hospital in Rouse Hill. We really appreciate your time and thank you very much for being here today.

As providers of healthcare, your experiences as patients are very valuable. However, please note that there is no obligation to disclose details of personal healthcare issues.

Throughout the workshop a researcher/facilitator will be with each table group to take notes, facilitate discussion and ask you questions. The workshop will go for 2 hours with a 10-minute break with refreshments after the first hour.

Audio-recording devices, flipcharts, and notes will be used to capture discussions. You will remain unidentifiable in the analysis and write-up of any findings relating to this research.

If you have any questions throughout the day, please ask one of the Macquarie University staff members (**introduce all staff members**).

Before we begin, we ask that your read and sign the PICF on your tables. If you have any questions before signing, now is the time to ask (**pause for questions**). Once you've signed, we will photocopy the documents and provide you with your own version."

Individual Group Introduction

"Good afternoon (morning/evening etc.) and welcome to the workshop. Thanks for taking the time to talk with us about what you would like to see in the new Rouse Hill Hospital. My name is (**insert name here**), and I am from the Australian Institute of Health Innovation at Macquarie University. We are working in partnership with Health Infrastructure and the Western Sydney Local Health District. My role as moderator will be to guide the discussion today.

Please note that there are no right or wrong answers but rather differing points of view. Please feel free to share your point of view even if it differs from what others have said. You don't need to agree with others' opinions, but we ask that you listen respectfully as others share their views.

You've probably noticed the microphone. We are taping the session because we don't want to miss any of your comments. People often say very helpful things in these discussions, and we can't write fast enough to get them all down. However, to make the recording as clear as possible, we ask that only one person speak at a time. And to remind you, no-one is identifiable on the recording.

Let's get started! Before we begin, if you wouldn't mind writing your name on the (name card/sticker in front of you. We will be on a first name basis today, but we won't use any names in our reports."

(Separate sheet of paper)

Please rate on the scale below the following:

2. **How comfortable are you using:**

A smart phone?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

A smart watch?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

Computers?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

3. **What proportion of your patients would be comfortable using:**

A smart phone?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

A smart watch?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

Computers?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

4. **So that we can understand you a bit better, what is your discipline?**

5. **Are you mostly:**

   Office based, facility based, a combination of both?

6. **What main problems do you currently encounter around delivering high quality care?**

7. **Can you suggest ways to overcome? (5 minutes)**

8. **What are you looking for in a new hospital?**
For example: IT/Scheduling/Accessibility

"Now that we have gotten to know each other a little better we would like you to reflect on a patient or patients who may or may not benefit from different "models of care". Today, we will talk about three different models of care in our workshop today. These are not the only models of care we are exploring, but we only have two hours, so will be talking about different models with different groups. We are interested in your thoughts about each of these models of care from your perspective and your patients' perspective. Some of these scenarios describe models you may have already encountered or engaged with. We would like you to think broadly."

Model 1:
Maria is a 65 year old patient who is ambulant and travels to a facility for routine care 2-3 times per week (e.g., renal dialysis, chemotherapy)

Please answer the following questions:

1. **In an ideal world, how would her care be delivered?**

Additional prompt: how could you best model this?

Model 1: Ambulatory Care and diagnostic hospitals

Non-admitted services, where patient care does not involve an overnight stay and usually involves diagnosis and treatment on the same day.

From your perspective:

2. **How would this model help to solve the big problems for you? (What are the pros/strengths for you?)**

3. **What barriers limit this model for you?**
4. **What enablers would need to be in place for this to work?**

From your patients' perspective:

5. **How would this model help to solve the big problems for your patients?**
6. **What might be the pros/strengths?**
7. **What barriers might limit this model for your patients?**
8. **What enablers would need to be in place for this to work?**

General questions:

9. **What proportion of your patients would this model work for?**

Low – Mid – High

10. **Can you think of anything about it that might be impractical?**
11. **Can you think of anything about it that might be unachievable?**
12. **To what extent could this model be applicable to other health conditions? What conditions?**
13. **Can you think of any clinicians or patients who might find this model of care difficult to access?**
14. **Is there anything about the model that concerns you?**
15. **What might be the safety issues for your patients?**
16. **Do you see any risks to you as the healthcare provider?**

(Additional prompts)

Are there any potential risks that you can identify?

- *"Why is that?"*
- *Can you suggest a better way?*

Model 2:

You are in a place you usually work at, and the facility has digital technology in place such as intravenous fluid charts, bed sensors to alert staff that a patient needs moving in bed, floor mats that alert staff when patients are out of bed, and interactive monitors for patients and staff about daily schedules.

Model 2: Digital Hospitals/Consumer Focused Care

Hospitals that make extensive use of new technologies to provide streamlined care, improve patient safety and care quality, and improve overall care cost effectiveness.

Repeat questions

Model 3:

Your patient has undergone a procedure or surgery and after treatment in the hospital is discharged home for follow-up care. For example: Jenny is a 35-year-old, single mother of three who developed complicated mastitis with an abscess following the birth of her baby. She was treated with intravenous antibiotics and a drain was placed into the abscess. After 24 hours, she returned home to her children and is provided wound care and support from a nurse.

Model 3: Hospital in the Home

Patient care and consultation which is typically delivered in the hospital settings is delivered to patients in their own home (e.g., intravenous therapy (antibiotics), anticoagulation, wound care, and chemotherapy).

Repeat questions

At end of focus group

Thinking broadly, from your perspective, please rate your preference for each model: (Note: Models X, Y, and Z will be replaced with the relevant models discussed at each workshop).

Model X	No pref	Neither suitable	Model Y
Model Y	No pref	Neither suitable	Model Z
Model Z	No pref	Neither suitable	Model X

Thinking broadly, from your patients' perspective, please rate your preference for each model: (Note: Models X, Y, and Z will be replaced with the relevant models discussed at each workshop).

Model X	No pref	Neither suitable	Model Y
Model Y	No pref	Neither suitable	Model Z
Model Z	No pref	Neither suitable	Model X

Concluding remarks:

We will be looking at your data to find commonalties between providers.

We are conducting exploratory research to gather information only, and all models may not be implemented. Thank you for your time.

BMJ Open

Innovative models of care for the health facility of the future: a protocol for a mixed-methods study to elicit consumer and provider views

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2021-059330.R1
Article Type:	Protocol
Date Submitted by the Author:	07-Sep-2022
Complete List of Authors:	Carrigan, Ann; Macquarie University, Australian Institute of Health Innovation Roberts, Natalie; Macquarie University Clay-Williams, Robyn; Macquarie University Hibbert, Peter; Macquarie University Pomare, Chiara; Macquarie University, Australian Institute of Health Innovation, Centre for Healthcare Resilience and Implementation Science Mahmoud, Zeyad; Australian Institute of Health Innovation, Faculty of Medicine & Health Science, Macquarie University, NSW, Australia; Universite de Nantes, LEMNA,F-44000 Maka, Katherine; Western Sydney Local Health District Mitchell, Rebecca; Macquarie University, Australian Institute of Health Innovation Zurynski, Yvonne; Macquarie University, Australian Institute of Health Innnovation Long, Janet; Australian Institute of Health Innovation, Australian Institute of Health Innovation Rapport, Frances ; Macquarie University, Australian Institute of Health Innovation Arnolda, Gaston; Macquarie University Faculty of Medicine and Health Sciences, Australian Institute of Health Innovation Loy, Graeme; Western Sydney Local Health District Braithwaite, Jeffrey; Macquarie University, Australian Institute of Health Innovation
Primary Subject Heading:	Health services research
Secondary Subject Heading:	Public health, Patient-centred medicine
Keywords:	Organisation of health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Organisational development < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Protocols & guidelines < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

Innovative models of care for the health facility of the future: a protocol for a mixed-methods study to elicit consumer and provider views

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Word count: 4580

ABSTRACT

Introduction: To address the challenges of rapidly changing healthcare, governments and health services are increasingly emphasising healthcare delivery models that are flexible, person-centred, cost-effective and integrate hospital services more closely with primary healthcare and social services. In addition, such models increasingly embed consumer co-design, integration of services, and leverage digital technologies such as telehealth and sophisticated medical records systems.

Objectives: This paper provides a study protocol to describe a method to elicit consumer and healthcare provider needs and expectations for the development of innovative care models.

Methods and analysis: A literature review identified six key models of care, supported by a common theme of consumer focused care, along with the international evidence supporting the efficacy of these models. A mixed-methods study of the needs and expectations of consumer members and health providers who reside or work in the area of a new hospital catchment will be undertaken. They will complete a community- and provider-specific, short demographic questionnaire (delivered during the recruitment process) and be assigned to facilitator-coordinated, online workshops comprising small focus groups. Follow-up interviews will be offered. Culturally and linguistically diverse members and Aboriginal and Torres Strait Islander Elders and their communities will also be consulted. Data will be analysed thematically (qualitative) and statistically (quantitative), and findings synthesised using a triangulated approach.

Ethics and dissemination: The results will be actively disseminated through peer-reviewed journals, conference presentations and in a report to stakeholders. This study was reviewed and approved by the relevant Ethics Committee in New South Wales, Australia.

Strengths and limitations of this study

- The study will be the first of its kind to identify the key evidence-based, innovative models of health care, considering the benefits and implementation considerations for each model, as perceived by consumers and healthcare providers.
- The study design is developed in collaboration with the Local Health District where the health facility will be located.
- A key strength of the study is the use of mixed-methods and the triangulation of data from multiple sources.
- A key limitation of the study is that the structure of workshops focused on specific scenarios which may not be generalisable.

BACKGROUND

Around the world, the delivery of quality hospital care is transforming in response to the availability of new and enhanced technologies and increasing demand for care.[1] Challenges to extant healthcare systems include an increase in the proportion of older adults in the population[2-4] that will redirect the focus of health towards long-term and chronic care.[3] Increased demand on the healthcare system comes from multiple sources, including higher prevalence of chronic diseases such as obesity, kidney failure[5] and cognitive decline.[3] The shift to patient-centred healthcare models[3] will also have resource implications while aiming for improvements in patient and staff satisfaction and quality of care.[6] To address the growing challenges globally, health services and governments are experimenting with more cost-effective care alternatives often delivered outside hospitals walls,[7] prioritising greater consumer engagement[8, 9] and investing in digitised care services.[10] Digital services have the potential to support more personalised care, integrated with existing models, and delivered remotely (e.g., telemedicine). Additionally, advanced technologies such as robotics, artificial intelligence (AI) and big data analytics may provide more seamless and efficient care.[4]

In 2018, Braithwaite and colleagues identified key trends shaping the health systems of the future: global demographic dynamics, work in creating sustainable health systems, evolving technologies such as genomics and AI, and new models of care. New models of care are emerging to meet new circumstances. For example, the COVID-19 global health pandemic in 2020 acted as a catalyst or trigger for change (e.g., rapid adoption of telehealth) that have been called for previously by those who suffer chronic conditions[11]. E-health, telehealth and virtual care models allowed patients to remain socially distant rather than having physical contact with the community and health services, simultaneously reducing the risk of the virus

spreading among patients and healthcare providers.[12] These innovative models take a novel approach to provide high quality and safe care in and out of hospital settings.[13]

In Australia, the New South Wales (NSW) government announced funding for a new health facility at Rouse Hill. The Western Sydney Local Health District (LHD) is planning the new health facility and is seeking innovative ways of delivering care that are more accessible, efficient, and effective for healthcare providers, funders and the population. In consultation with our research team, it was believed that there was an opportunity to create a different kind of facility – a modern and digitally-enabled capability. Seeking views from consumers and providers will ensure that the way the facility provides services is deeply connected to community needs. These include physical, health and psychosocial needs; rapid access to care for consumers; and adequate resources and infrastructure for providers.

The goal of this project is to provide a research-based approach to develop an innovative health facility and health service; one that delivers a high-quality care solution for the community rather than simply establishing more hospital beds, departments, units, and wards. Realising this vision will have far-reaching implications for the design and delivery of health services in the future. But to develop any new model for integrating community and hospital acute care and support services, we need to turn to the community and health care providers to understand their expectations and the healthcare needs that may be met by innovative models of care. While we are gaining data to inform the construction and design of a "hospital", we use the term "health facility" to reflect blue sky thinking and avoid being constrained by language that implies a large conglomeration of buildings and beds.

Identifying evidence-based models of care

Before eliciting consumers' and providers' needs and expectations, we needed to assess the evidence to identify candidate models of care. We therefore undertook a grey literature

review to identify potential models of care, followed by an academic review of the international evidence supporting the efficacy of these models.

The grey literature review involved an advanced search using Google and included websites such as World Health Organization and Organization for Economic Co-operation and Development (OECD) using search terms such as “future hospital”. Two reviewers completed a title and abstract screen and three reviewed the full-text documents. Eighty-five documents were included, comprising 55 reports, 17 online newspaper articles, 10 articles or bulletins from organisation websites, two online articles and an opinion piece. From this review, six key themes were deductively determined that were used to group innovative models of health care. Consumer focused care, where during planning, delivery, and evaluation, consumers, carers, and families are placed at the centre of care was a common theme that underpinned the other six models. For example, individualised self-management support in early chronic kidney disease transition of care plan from hospital to home involving a multidisciplinary team.[5] As such, only six models will be presented, each incorporating consumer-focused care (see Table 1). Benefits, drawbacks, and past implementation of the models were also identified.

The Preferred reporting Items for Systematic Reviews (PRISMA) was used to guide the academic literature review to extract the evidence-based support for the models of care identified in the grey literature.[14] Search strings chosen from prevalence data of the focal community in the context of the models were applied to three academics databases (PsychINFO, Ovid MEDLINE, and CINAHL). For example, “virtual hospital” AND “cardiac arrest”. Sixteen reviewers (eight pairs) completed a title and abstract screen and subsequently reviewed the full-text documents. Given the large numbers of papers resulting from the searches (i.e., over 200,000 results), the researchers confined the searches to review papers

only. Sixty-one peer-reviewed, English language review studies with human subjects, dated 2016-2021, met the criteria for inclusion. This review will be reported separately.

Table 1: Six evidence-based innovative models of care

Model	**Description**	**Example**
Ambulatory care and diagnostic hospitals	Non-admitted services, where patient care does not involve an overnight stay and usually involves diagnosis and treatment on the same day.	Same day joint arthroplasty[15]
Digital hospitals	Hospitals that make extensive use of new technologies to provide streamlined care, improve patient safety and care quality, and improve overall care cost effectiveness.	Machine learning algorithm for prediction of post-total hip arthroplasty complications[16]
Hospital in the home	Some or all of patient care and consultation which is typically delivered in the hospital settings is delivered to patients in their own home.	Early discharge hospital at home care for chronic obstructive airways disease managed by a community service[17]

Integrated care	Multidimensional needs of the patient are delivered in a coordinated manner by an interdisciplinary team or network of healthcare professionals	Orthogeriatric fracture service[18]
Virtual care	Patient care and consultation delivered through telephone or video communication.	Telehealth management in patients with heart failure[19]
Specialist hospitals and population specific care units	Specialist hospitals provide selective care services for targeted patient groups. Population-specific care units are pathways within general hospitals dedicated to treatment of specific conditions	Comprehensive cancer centres[20]

METHODS

Study Aim

The study aims to elicit health consumers' and healthcare providers' needs drawn from the local community and expectations of a new health facility, and how these needs may be met through the delivery of innovative models of care.

Study Design

We will conduct a mixed-methods study of consumer and provider needs and expectations in relation to innovative models of care delivery for a new health facility. As illustrated in Figure 1, the design comprises collections of consumer and provider data via a short expression of interest (EOI) questionnaire comprising demographic information (as part of the recruitment process), facilitator-coordinated workshops, and supplementary interviews.

Data collection will occur in a sequential manner, where results from the EOI questionnaire will inform workshop design. In addition, interview design and recruitment will be informed by the learnings from the workshops. Together, these methods of data collection will facilitate a varied and dynamic exploration of community and provider needs and expectations for innovative models of healthcare (see Figure 1).

FIGURE 1 HERE

Study Setting

The project will be conducted online and in person. Specifically, the recruitment demographic questionnaire will be hosted and completed online. The face-to-face workshops will be held at public metropolitan hospitals and community centres in New South Wales (NSW), Australia. Participants will be provided with options to attend workshops during, or outside of working hours. For face-to-face workshops, we will follow all current COVID-19 guidelines that are current at the time of data collection (e.g., social distancing, wearing of masks). In addition, the meeting format will be adjustable to being video-enabled to respond to any face-to-face restrictions in place associated with the COVID-19 pandemic. Supplementary interviews with interested participants identified in the workshops will be conducted via an online platform such as Zoom or over the telephone for participant convenience.

The catchment area where a new health facility is currently being planned comprises a land area of almost 500 square kilometres and a population estimated in 2019 to be 300,000 residents estimated in 2019. Between the 2006 and 2016 population censuses, the catchment experienced a population growth rate of 29% and this growth rate was predicted to rise when assessed using the 2021 census data.[21, 22] The 2016 Census reported that adults aged 35-44 years and school aged children aged 5-9 years were the largest age groups, 37% of the

population was born outside Australia and 0.9% identified as Aboriginal and/or Torres Strait Islander.[23] As such, the workshops will include participants who self-identify with these diverse populations.

Procedures

Recruitment:

Consumer members will include residents and patient representatives within the new health facility catchment (49 suburbs) as defined by the LHD's planning team on 16th July 2021. The participants will be recruited through the LHD's network and connections via email, postings in local newspapers and through Facebook invitations. For providers, emails will be sent by the LHD to potential participating providers such as healthcare professionals and support staff via their established connections. These connections include, but are not limited to, consumer networks, LHD community newsletters, migrant resources centres, the Primary Health Network, and the Youth Advisory Council. To reach potential consumer participants who may not have access to email or the internet, the invitation will also be posted in local newspapers and advertised as flyers at LHD hospitals. For providers, emails will be distributed via the LHD's Broadcast system, the Primary Health Network, and from the Chief Executive Officer.

As 37% of the consumers are from culturally and linguistically diverse (CALD) backgrounds, non-English speaking participants will invited to participate in the study, aided by bi-lingual interpreters from the LHD. The research materials comprising the invitation, EOI questionnaire, workshop and interview scripts will be translated into the five most prevalent non-English languages in the community - Hindi, Punjabi, Mandarin, Korean and Arabic.

For those accessing the research invitation electronically (via email or Facebook advertisements), the invitation will include a link to an online EOI questionnaire using REDCap electronic data capture tools.[24] The questionnaire will collect demographic data

including age, gender, location, ethnicity and contact information. The providers will be asked to indicate their role and specialty, and the consumers will be asked for pertinent health information such as whether they have a chronic health condition (Supplementary File 1). Responses to the questionnaire will be taken as implied consent for collection of the demographic information.

The provided contact information will be used to send the participant details about the location and time of the workshops (either via phone or email – as selected by the participant). For all participants who attend a workshop, we will ask for written informed consent prior to commencement of the workshop. Participants will be sent the Participant Information and Consent Form (PICF) prior to the workshop so that they can come prepared with questions for the research team. Once participants sign the consent form, the research staff will photocopy the PICF and provide a copy to each consenting participant. In the event of delivering the workshops online, a link will be sent to the participants for access to the PICF presented using REDCap tools.[24]

After each workshop, those who express interest in an optional follow-up interview will be contacted to confirm the findings. The PICF for the workshop informs participants that they may be contacted after the workshop to be invited to a follow-up interview. Figure 2 provides a map of the recruitment process for consumers and providers.

INSERT FIGURE 2 HERE

Workshops:

There will be a total of 12 workshops across two streams of six: one stream for health providers and another for consumer members. Two to four additional workshops will be held for culturally and linguistically diverse (CALD) consumers and Aboriginal and Torres Strait Islander consumers. Each workshop has been designed to elicit responses to the seven

models of care. To do this, we will divide participants into smaller parallel groups that each will examine three models of care in detail, rather than present all seven models and induce fatigue. The models have been counterbalanced across the eight workshops, to ensure that the presentation and order of each model is balanced. There will be up to eight facilitators and scribes at each workshop (a facilitator and scribe per group). Where needed, some groups within the workshops will be supported by bi-lingual interpreters. The number of participants in each workshop group has been designed based on our collective research experience as an appropriate number for elicitation of the data we are seeking and is consistent with the number of participants in focus groups where people feel relatively comfortable speaking to others.[25]

The workshops will start with a short explanation by a research team lead, explaining that the purpose of the workshop is to capture the needs of the consumers or providers and their perspectives on innovative models of care delivery. They will then allocate the researchers and participants to the groups. Within each group, the researchers will take notes, facilitate discussion, and ask probing questions. Audio-recording devices and researcher notes will be used to capture the content of discussions.

After a brief icebreaker activity, the researchers will then ask questions to probe the participants' digital literacy (e.g., "How comfortable are you using a smartphone/smartwatch/computer?"). These questions are included as two of the models of care presented (virtual care and digital hospitals) involve engagement with technology and understanding the level of participant digital literacy will be important for interpreting the findings. Workshop scenarios and questions have been designed around consumer focused care and the six innovative models of care identified in the literature review in collaboration with a clinical subject matter expert and co-author (KM) (Table 1). The priority conditions used in the scenarios have been identified from the demographic data provided by the LHD

as the most common burdens of disease in the new health facility catchment and are listed below:

1. Cardiac arrest, chest pain, acute myocardial infarction, congestive heart failure.
2. Fractures, knee replacement, hip replacement, joint replacement, abnormal gait, bone disease, osteoporosis.
3. Abdominal pain, pelvic pain, gastrointestinal pain.
4. Pneumonia, asthma, chronic obstructive pulmonary disease.
5. Postnatal depression.
6. Dialysis (haemodialysis etc.), kidney disease, end-stage kidney disease.

Scenarios will be presented to participants for each model of care (see Table 2). Three of the six models along with the scenarios will be presented in each workshop, in counterbalanced order to minimise biases (e.g., 1 2 3, 4 5 6; 2 3 1, 5 6 4 etc.).

Table 2: Models of care and scenarios

Model	**Scenario**
Ambulatory care and diagnostic hospitals	"Maria is a 45 year old woman who is able to walk unaided and travels to a centre for treatment 2-3 times per week (e.g., renal dialysis in a shopping centre, or chemotherapy)."
Digital Hospital	**"**John is a 70-year-old man who has a heart condition that causes dizziness (e.g., irregular heartbeat). As this places him at a high risk of falls, he has been admitted to hospital for monitoring. Beside his bed is a digital matt that detects and alerts the staff if he has had a fall."

Hospital in the Home	**"**Jenny is a 35-year-old, single mother of three who developed a breast infection with an abscess following the birth of her baby. She was treated with intravenous antibiotics (on a drip) and a tube was placed into her breast to drain the infected fluid. After 24 hours, she returned home to her children and is provided wound care and support in her home from a visiting nurse."
Integrated Care	"Steve is a 50-year-old man with Type II diabetes who is obese and smokes a packet of cigarettes a day. He is having trouble walking so visits his local Emergency Department where he sees a General Practitioner (GP), who has a practice in an office next to the Emergency Department. The GP diagnoses a foot ulcer and identifies that Steve requires a full review of his care. Steve will be looked after in hospital by a multidisciplinary team of healthcare professionals (e.g., endocrinologist, ulcer team, nutritionist) using an electronic medical record system for communication."
Virtual Care	"Ivy is a 40-year-old woman who developed chest pain along with an irregular heartbeat following a dental procedure. She visited the local Emergency Department where no abnormality was found and was discharged. As she was still concerned about a sudden heart attack, she was fitted with a digital heart monitor with chest leads that talked to an application on her smart watch. Ivy was shown how to indicate an unusual heart event using her watch. Anytime Ivy tagged an event, the information was sent to a health care professional at the moment it happened."
Specialist hospitals and population specific care units:	"Harrold is an 82-year-old man with mild dementia, who develops a urinary tract infection. He has been referred to a specialist dementia unit in a geriatric care

	ward at the local hospital. Harrold and his family are reassured that he will receive the highest level of evidence-based care for dementia from a specialised team of health professionals."

Following the presentation of each scenario, we will ask general questions about the model's strengths and weaknesses, usability and safety for themselves and people in their care. To understand patient needs, questions will be asked about how each model would work, with participants thinking about their own care, as well as the safety and risks, For providers, we will ask them about barriers and enablers from their own and their patients' perspectives, for each model of care, and their anticipated needs when providing care in the new hospital. At the end of each workshop, the participants will be asked to indicate their preferred model of care via a poll. Example facilitator scripts for the consumer and provider groups are provided in Supplementary File 2.

Each workshop will be planned for a two-hour duration with a five-minute break after the first hour. Each participant will be invited to participate in one workshop but will be offered a series of dates to choose from. Participants will not be paid for their participation but those who attend in person will be provided with refreshments.

Participants:

The consumer workshops will include residents of the new health facility catchment area. Provider workshops will comprise health providers that provide care or are likely to provide care and stakeholders who make decisions about the provision of care such as LHD executives and administrators, for the catchment population. In the first wave of data collection, we will recruit 15-30 participants for each of the workshops (this estimation takes into consideration participant loss to follow-up). Six workshops will result in approximately 120 health providers and 120 consumer member participants (240 participants in total).

However, the number of participants invited to each workshop may be influenced by government-mandated COVID-19 restrictions at the time of data collection. In a second wave, up to 40, non-English speaking, CALD participants will be recruited with the support of the LHD's Multicultural Health Team.

In parallel, there will be a third, but separate but aligned, a wave of data collection, to include consultation with Aboriginal and Torres Strait Islander Elders. Consultation with these community members will involve a formal process of consultation with Aboriginal Liaison Officers in the LHD to develop an Aboriginal Health Impact Statement and associated ethics proposal. This consultation will be conducted in person to ensure this is delivered in a culturally respectful manner as directed by the Aboriginal Liaison Officers in the LHD.

Inclusion criteria:

All participants will be 18 or older and will either have English language competence (written and spoken) or interpreter-assisted non-English language (written and spoken), sufficient to provide verbal informed consent. The study is open to all community members, but we will also specifically seek to recruit participants representative of the six specific health conditions/services by targeting the recruitment of condition networks associated with these health conditions.

Those who currently provide care to those residing in the catchment for the new health facility, or who make decisions about the provision of care for those residing in the catchment, are eligible to participate. This will include general practitioners and other health providers such as community nurses and services, allied healthcare professionals, aged care facilities, community care organisations, the primary health network, community care providers, the ambulance service, and other identified stakeholders. The inclusion criteria are broad enough to capture any health provider in the LHD or new health facility catchment, but

we will also target participants whose work relates to patients in the six specific listed conditions or services.

Interviews:

Supplementary to the workshop, we will invite those participants who are key stakeholders but were unable to participate in the workshop, or those who indicate interest during the workshops to participate in semi-structured interviews. The purpose of these interviews is to expand on areas of interest and verify the findings from the workshop data. The focus of the interviews will be driven by those who volunteer. For example, if a consumer has experience with a model (e.g., hospital in the home for renal dialysis) one-on-one interviews will allow us to probe further into the specific barriers and enablers of the model while maintaining participant privacy. Interviews will be audio-recorded and are expected to last approximately 45 minutes. The interview script commences with "For Model X, can you please elaborate on what you think is meant by the strengths/barriers/enablers/safety issues…", and is deliberately open-ended to allow the participant to freely express their views. The interview script is provided in Supplementary File 3.

Data collection:

Participants' demographic information (e.g., age, gender) and health-relevant data will be collected through the EOI questionnaire. Consumers will be asked about their experiences using acute, chronic and outpatient services, their ethnicity, language spoken at home, and residential postcode. Consumers will be allocated a workshop group based on their experiences with healthcare services. Where possible, consumers with common experiences (e.g., chronic conditions) will be allocated to the same group. Additionally, CALD participants will be allocated to a group and presented with models which are perceived to be of increased relevance for this population (e.g. virtual care, digital hospital). Aboriginal and Torres Strait Islander peoples will be presented with all six models. Providers will be asked to

indicate their role, clinical specialty, whether they are employed by the LHD, and work postcode. Where possible, providers with similar roles (e.g., nurses, general practitioners) will be allocated to the same group. In the case of workshops being delivered online, participants will be sent their information and consent forms to sign before attending.

The workshops and supplementary interviews will be run by a team of experienced health services researchers and will explore the experiences and views of participants concerning innovative models of care. Responses will be audio recorded. Key themes and different points of view will be identified and recorded for qualitative analysis. Each group within a workshop will provide their written notes and observations to the workshop facilitator who will collate the data. The data will then be aggregated across all the workshops for analysis, separately for consumers and providers.

Planned data analyses:

The quantitative data that includes demographic and health-related data from the EOI questionnaire will be analysed using SPSS V.22.0[26] and weighted against the Australian Bureau of Statistics data for the catchment, to assess the representativeness of the sample. Consumer and provider workshop and interview data for each model will be merged into two aggregated, narrative summaries, one for consumers and one for providers. All participants will be de-identified, and any identifiable features of the experiences or personal details shared in the group will be changed (e.g., if a unique service or practitioner is mentioned; or features of the disease that identifies the patient). Data collected in the workshops and interviews will only be used for this research project. Aggregated data sets will be analysed separately for consumers and providers.

Qualitative data (i.e., facilitator notes and key elements of the workshop recordings) will be thematically analysed independently using an open coding process by two members of the research team, who will work together to resolve discrepancies. Themes will be extracted that

characterise the expectations and needs of the consumers and health providers in terms of the new health facility catchment. Any variation in response, or conflicting views, will be reported. Data collection and analysis will occur iteratively; questions used for workshops and guides for observations will be refined and expanded as new findings emerge.

Synthesising and integrating results:

Data will be synthesised using a triangulated approach, whereby literature review findings, community characteristics, and findings from the focus groups and interviews will be integrated to arrive at a set of evidence-based, community-and-provider-supported strategies for delivering care to those in the healthcare catchment. Figure 3 illustrates the data collection, analysis and synthesis strategy for the project. Triangulated findings will be used to inform planning options and the feasibility of implementation of the options for the development of the new health facility.

INSERT FIGURE 3 HERE

Patient and Public Involvement

No patient was involved. No patient data is reported in this paper.

Discussion

This study seeks to examine consumer and provider needs and expectations for the development of an innovative care model for a health facility, specifically about six evidence-based models of care, and the consumer-focused care that underpins them, and the health conditions that form major burdens of disease found in a diverse catchment area in metropolitan NSW, Australia. The study investigates community perspectives on each model of care in detail, each presented within a purpose-designed, contextualised health scenario. Healthcare delivery is changing due to the introduction of new and enhanced technologies,

the increasing social and economic burdens of ageing populations, and the prevalence of chronic disease, amongst other factors. Therefore, it is important that we use these findings to guide the development of new healthcare facilities to ensure that both consumer and provider needs are met. These findings may be used to inform policies on how to design new healthcare facilities in consideration of consumer and provider needs.

The limitations of this study may include the following factors: due to the scope of the project, we cannot include an exhaustive list of health conditions. We have used a data-driven approach to stratify the main diseases reported in the new catchment as defined by the LHD. In addition, this study is limited to the local health district under investigation and the specific needs of the consumer and providers in that district and the catchment area could change as the LHD redefines its boundaries. Finally, low rates of participant enrolment is a potential limitation. To address this, we have ensured that our recruitment strategy is designed so that the study is advertised widely across several different mediums, and locations to increase the likelihood of snowballing. In the case of low recruitment numbers, we will readvertise the study.

Expected outcomes

Adopting an evidence-based approach, we will elicit opinions from consumers and providers within the catchment of a new healthcare facility about the barriers and enablers associated with consumer-focused care and six innovative care models. Findings will be available to provide guidance in designing care models for future health facility development, in Australia and globally. Ultimately, the outcomes will help to ease the burdens that many health facilities face such as the increasing social and economic burdens of ageing populations, and the prevalence of chronic disease.

Ethics and Dissemination: There are no known health or safety risks associated with participation in any aspect of the described study. Ethics approval for conducting the study was obtained from the Local Health District Human Research Ethics Committee (2021/PID01000). The results will be actively disseminated through peer-reviewed journals, conference presentations and reports to stakeholders.

Contributors: GL, JB, RCW and PH conceptualised the study. AC, NR, CP, ZM, RCW, PH, KM, RM, YZ, JL, FR, GA and JB contributed to the design of the study. AC drafted the initial manuscript, assisted by NR, CP, ZM, RCW, PH and JB. All authors contributed to the refinement of the paper and approved the final manuscript.

Acknowledgements: The authors wish to thank Natasia Seo, Anita Calderan and Chrissan Segaram for their advice, and assistance in obtaining the demographic data for the health facility catchment area. The authors also wish to thank Monika Latanik and the Local Health District's Multicultural Unit for assisting with the planning for CALD recruitment and interpretation services.

Data availability statement: No additional data available.

Funding: The study was funded by Health Infrastructure (NSW, Australia), as an independent consultancy to support a larger project developing and implementing a new health facility in Sydney, Australia. Grant number HI20314. The funder did not play a part in the design, conduct or reporting of this study.

Competing interests: Nil to declare

Disclaimer: The views expressed herein are the personal views of the authors and not necessarily those of Western Sydney Local Health District, Health Infrastructure, or the NSW Ministry of Health, and are not to be understood or quoted as being made on behalf of or reflecting the positions of those organisations.

Patient consent for publication: Participants will provide written consent in accordance with the HREC-approved Patient Information and Consent Form, which detailed how the findings would be disseminated. No patient data is reported in this paper.

Provenance and peer review: Not previously submitted or under consideration elsewhere.

Figure 1: Data collection points over time for consumer and provider groups.

Figure 2: Recruitment process map

Figure 3: Recruitment process and data plan for the project

References

1. Braithwaite J, Mannion R, Matsuyama Y, Shekelle PG, Whittaker S, Al-Adawi S. Healthcare systems: future predictions for global care. Boca Raton, Florida: CRC Press; 2018.

2. Amalberti R, Nicklin W, Braithwaite J. Preparing national health systems to cope with the impending tsunami of ageing and its associated complexities: Towards more sustainable health care. Int J Qual Health Care. 2016;28(3):412-4.

3. Braithwaite J, Mannion R, Matsuyama Y, Shekelle PG, Whittaker S, Al-Adawi S, et al. The future of health systems to 2030: a roadmap for global progress and sustainability. Int J Qual Health Care. 2018;30(10):823-31.

4. Penno E, Gauld R. Change, Connectivity, and Challenge: Exploring the Role of Health Technology in Shaping Health Care for Aging Populations in Asia Pacific. Health Syst Reform. 2017;3(3):224-35.

5. Havas K, Douglas C, Bonner A. Meeting patients where they are: improving outcomes in early chronic kidney disease with tailored self-management support (the CKD-SMS study). BMC Nephrol. 2018;19(1):279.

6. Joseph A, Kirk Hamilton D. The Pebble Projects: coordinated evidence-based case studies. Build Res Inf. 2008;36(2):129-45.

7. Conley J, O'Brien CW, Leff BA, Bolen S, Zulman D. Alternative strategies to inpatient hospitalization for acute medical conditions: a systematic review. JAMA Internal Medicine. 2016;176(11):1693-702.

8. Chewning B, Bylund CL, Shah B, Arora NK, Gueguen JA, Makoul G. Patient preferences for shared decisions: a systematic review. Patient Educ Couns. 2012;86(1):9-18.

9. Frist WH. Connected health and the rise of the patient-consumer. Health aff Web exclusive. 2014;33(2):191-3.

10. Khan A, Mir MS. Digital Hospitals. Scholarly Journal of Biological Science. 2021;10(1):104-6.

11. Smith AC, Thomas E, Snoswell CL, Haydon H, Mehrotra A, Clemensen J, et al. Telehealth for global emergencies: Implications for coronavirus disease 2019 (COVID-19). J Telemed Telecare. 2020;26(5):309-13.

12. Duffy S, Lee TH. In-person health care as option B. N Engl J Med. 2018;378(2):104-6.

13. Lansisalmi H, Kivimaki M, Aalto P, Ruoranen R. Innovation in healthcare: a systematic review of recent research. Nurs Sci Q. 2006;19(1):66-72.

14. Moher D, Liberati A, Tetzlaff J, Altman DG, Group P. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. PLoS Medicine. 2009;6(7):e1000097.

15. Carey K, Morgan JR, Lin MY, Kain MS, Creevy WR. Patient Outcomes Following Total Joint Replacement Surgery: A Comparison of Hospitals and Ambulatory Surgery Centers. J Arthroplasty. 2020;35(1):7-11.

16. Shah AA, Devana SK, Lee C, Kianian R, van der Schaar M, SooHoo NF. Development of a Novel, Potentially Universal Machine Learning Algorithm for Prediction of Complications After Total Hip Arthroplasty. J Arthroplasty. 2021;36(5):1655-62 e1.

17. Bal Özkaptan B, Kapucu S. Home nursing care with the self-care model improves self-efficacy of patients with chronic obstructive pulmonary disease. Jpn J Nurs Sci. 2016;13(3):365-77.

18. Naranjo A, Fernandez-Conde S, Ojeda S, Torres-Hernandez L, Hernandez-Carballo C, Bernardos I, et al. Preventing future fractures: effectiveness of an orthogeriatric fracture liaison service compared to an outpatient fracture liaison service and the standard management in patients with hip fracture. Arch Osteoporos. 2017;12(1):112.

19. Oliveira JAd, Cordeiro RG, Rocha RG, Guimarães TCF, Albuquerque DCd. Impact of telephone monitoring on patients with heart failure: a randomized clinical trial. ACTA Paul Enferm. 2017;30(4):333-42.

20. Grant SJ, Marthick M, Lacey J. Establishing an integrative oncology service in the Australian healthcare setting - the Chris O'Brien Lifehouse Hospital experience. Support Care Cancer. 2019;27(6):2069-76.

21. Australian Bureau of Statistics: Australian Statistical Geography Standard (ASGS) 2021. https://www.abs.gov.au/websitedbs/d3310114.nsf/home/australian+statistical+geography+standard+(asgs) accessed 1 May 2021.

22. Australian Bureau of Statistics : 2016 Census. https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/2916.0main+features252016 accessed 1 May 2021 [Available from: https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/2916.0main+features252016.

23. Epidemiology and Health Analytics, Western Sydney Local Health District. Epidemiological Profile - Rouse Hill Catchment Area (RHCA) Residents. 2021. Sydney: Western Sydney Local Health District; 2021.

24. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009;42(2):377-81.

25. Bloor M. Focus groups in social research. London: UK: SAGE Publications; 2001.

26. IMB C. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp. 2013.

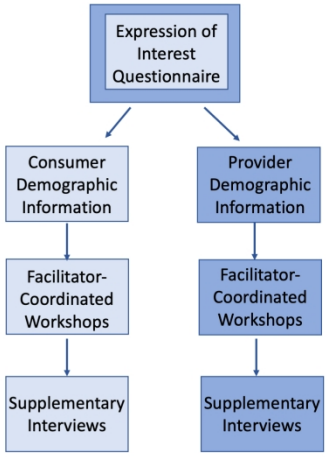

Figure 1: Data collection points over time for consumer and provider groups.

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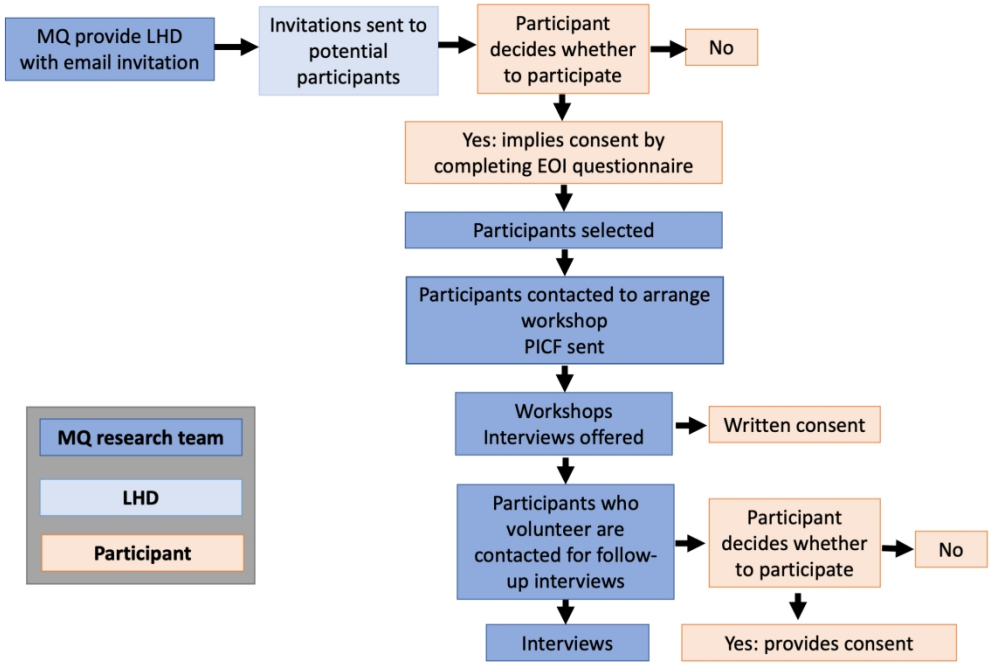

Recruitment process map

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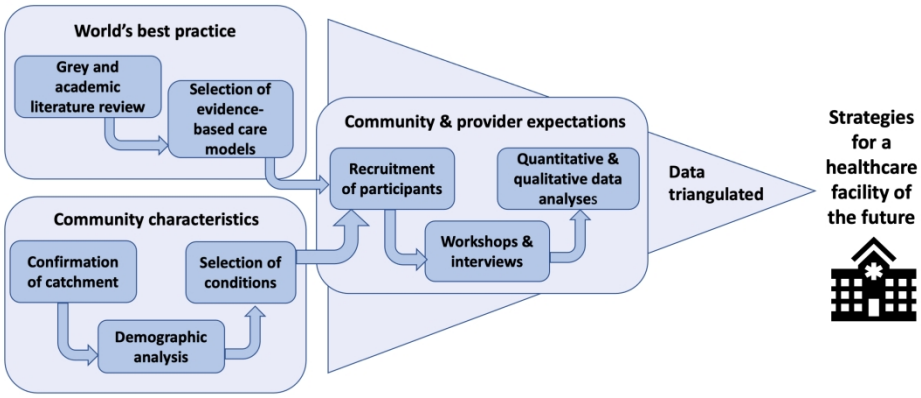

Figure 3: Recruitment process and data plan for the project

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Expression of interest questionnaire

Thank you for your interest in participating in our study. We want to hear from you and discuss ways that healthcare services could be delivered in and around the new Rouse Hill Hospital. The district includes **Annangrove, Acacia Gardens, Angus, Baulkham Hills, Beaumont Hills, Bella Vista, Box Hill, Carlingford, Castle Hill, Cattai, Colebee, Dural, Gables, Glenhaven, Glenorie, Glenwood, Grantham Farm, Kellyville, Kellyville Ridge, Kenthurst, Leets Vale, Lower Portland, Maraylya, Maroota, Marsden Park, Melonba, Middle Dural, Nelson, Nirimba Fields, North Kellyville, North Rocks, Norwest, Parklea, Quakers Hill, Richards, Riverstone, Rouse Hill, Sackville North, Schofields, Shanes Park, South Maroota, Stanhope Gardens, Tallawong, The Ponds, West Pennant Hills, Winston Hills, Wisemans Ferry, and Vineyard.** We will be holding a series of two-hour workshops in the local community with patients, consumers, community members and health care providers. To express interest in attending a workshop, please complete this short questionnaire about yourself. If you are unsure whether you would like to participate, you may wish to attend one of our information sessions first before you decide.

The research team will contact you to provide information about the workshop location and time. We will include a representative sample of the community and health care providers (e.g., we want people of different ages, background, professions, and healthcare needs), but we may not be able to include all of the people that apply. You will be informed either way if you have been invited to participate in the workshop or the other ways you can be involved in this important study.

Questionnaire:

Please tick the boxes for all of the answers that apply to you within each question.

1. Are you interested in talking to us about how services will be delivered in and around the new Rouse Hill Hospital

   ☐ Yes
   ☐ Unsure, I would like more information. Please send me the details of the information sessions.
   ☐ No I am not interested

2. Are you one of the following?:
   ☐ I am a patient/ health consumer/ community member in the Western Sydney community
   ☐ I am a carer/consumer representative in the Western Sydney community
   ☐ I am a health provider in the Western Sydney community

[If selected “I am a health provider” to Q2]

What is your role? (Please tick all that apply)

☐ Administration/ Clerical
☐ Allied health professional/Allied health assistant
☐ Nursing (Registered nurse/Enrolled nurse/Assistant in nursing)
☐ Midwifery
☐ Medical (Consultant, Career Medical Officer, Registrar/JMO)
☐ General practitioner
☐ Community Pharmacist

- ☐ Property services/ Maintenance
- ☐ Ancillary services: Catering, cleaning
- ☐ Porter
- ☐ Management
  - ☐ Team leader
  - ☐ Nursing Unit Manager
  - ☐ Head of Department
  - ☐ Director
  - ☐ Executive staff
- ☐
- ☐ Other (please specify)
  …….

Postcode where you work:

…….

Are you employed by Western Sydney Local Health District (WSLHD)?

- ☐ Yes
- ☐ No
- ☐ I would rather not say

Do you work in any specific clinical areas delivering services for people with the following conditions (please tick all that apply):

- ☐ Heart conditions
- ☐ Bone injuries and conditions
- ☐ Abdominal conditions
- ☐ Lung conditions
- ☐ Dialysis or kidney disease
- ☐ Postnatal depression
- ☐ Other illnesses

[if selected "I am a health consumer" to Q2]

3. As community members, your views on healthcare are valuable. We are interested in your views on the way healthcare is delivered, whether you are affected by a specific medical condition, or not. We have included a list of some conditions that may affect you, however, we are interested in your perspectives even if none of the conditions apply to you. Do any of these conditions or access to services outlined below personally affect you (please tick all that apply):

   - ☐ Emergency Care: An injury or illness that required you to visit the Emergency Department at hospital (e.g., heart attack or bone fracture)

     Please select all that apply:
     - ☐ Heart conditions (e.g. cardiac arrest, chest pain, heart attack)
     - ☐ Bone injuries and conditions (e.g. fractures, knee and hip replacement)

- ☐ Abdominal conditions (e.g. pelvic pain, abdominal pain, gastrointestinal pain)
- ☐ Lung conditions (e.g. pneumonia)
- ☐ Postnatal depression
- ☐ Other illnesses or experiences where you went to Emergency Care

☐ Chronic Care (non-emergency care): where you have a condition that lasts one year or more and requires ongoing medical attention or limits activities of daily living or both (e.g., renal disease or asthma).

Please select all that apply:

- ☐ Heart conditions (e.g. congestive heart failure)
- ☐ Dialysis or kidney disease (e.g. haemodialysis)
- ☐ Bone conditions (e.g. osteoporosis, abnormal gait etc.)
- ☐ Lung conditions (e.g. chronic obstructive pulmonary disease, asthma)
- ☐ Other illnesses or experiences (e.g., chronic post-natal depression)
- ☐ I am not affected by any chronic conditions

☐ Outpatient Clinics

Please select all that apply:

- ☐ Fracture
- ☐ Cardiac
- ☐ Diabetes
- ☐ Renal
- ☐ Other

[if selected “I am a carer” to Q2]

Are you a carer for someone who is affected by any of these conditions or access to services outlined below (please tick all that apply)?

☐ Emergency Care: An injury or illness that required the person you care for to visit the Emergency Department at hospital (e.g., heart attack or bone fracture)

Please select all that apply:

- ☐ Heart conditions (e.g. cardiac arrest, chest pain, heart attack)
- ☐ Bone injuries and conditions (e.g. fractures, knee and hip replacement)
- ☐ Abdominal conditions (e.g. pelvic pain, abdominal pain, gastrointestinal pain)
- ☐ Lung conditions (e.g. pneumonia)
- ☐ Postnatal depression
- ☐ Other illnesses or experiences where you went to Emergency Care

☐ Chronic Care (non-emergency care): where the person you care for has a condition that lasts one year or more and requires ongoing medical attention or limits activities of daily living or both (e.g., renal disease or asthma).

Please select all that apply:

- ☐ Heart conditions (e.g. congestive heart failure)
- ☐ Dialysis or kidney disease (e.g. haemodialysis)
- ☐ Bone conditions (e.g. osteoporosis, abnormal gait etc.)
- ☐ Lung conditions (e.g. chronic obstructive pulmonary disease, asthma)
- ☐ Other illnesses or experiences
- ☐ The person I care for is not affected by any chronic conditions

4. What is your age?

- ☐ Under 30y
- ☐ 31-45y
- ☐ 46-60y
- ☐ 61y+
- ☐ Prefer not to answer

5. Gender: How do you identify?
   - ☐ Male
   - ☐ Female
   - ☐ Other
   - ☐ Prefer not to answer

6. Postcode of where you live: (_____)

7. How would you rate your English language skills?
   - ☐ Excellent
   - ☐ Good
   - ☐ Average
   - ☐ Not good

8. Do you speak a language other than English at home?
   - ☐ Yes: Please select which one
     - ☐ Punjabi
     - ☐ Hindi
     - ☐ Mandarin
     - ☐ Korean
     - ☐ Arabic
     - ☐ Cantonese
     - ☐ Dari
     - ☐ Greek
     - ☐ Italian
     - ☐ Maltese
     - ☐ Persian

- ☐ Tamil
- ☐ Tongan
- ☐ Urdu
- ☐ Other – please specify (_____)

☐ No

9. With which ethnic group do you identify? (answer all that apply)
   - ☐ Australian
   - ☐ Aboriginal or Torres Strait Islander
   - ☐ New Zealander
   - ☐ Asian
   - ☐ Indian
   - ☐ Middle Eastern
   - ☐ European
   - ☐ North American
   - ☐ South American
   - ☐ African
   - ☐ Other, please specify: (_____)

10. Are you happy to be contacted to attend a group discussion/workshop?
    - ☐ Yes
    - ☐ No

[If no to Q10, then end survey]

11. What is your preferred contact method?
    - ☐ Phone call
    - ☐ Email

12. The five main non-English languages spoken in the Rouse Hill district are Punjabi, Hindi, Mandarin, Korean and Arabic so we will offer workshops in these languages. If you would prefer to engage with a person who speaks your language to provide written and spoken information at a group discussion/workshop, please indicate below:

    ☐ Yes: I would like a bilingual interpreter available at a group discussion/workshop.

    Please select which language:
    - ☐ Punjabi
    - ☐ Hindi
    - ☐ Mandarin
    - ☐ Korean
    - ☐ Arabic

    ☐ No: I am happy to communicate in English (written and spoken).

13. Please leave your name and telephone number and/or email address so we can contact you.

Expression of interest questionnaire

First name: …….

Surname: …….

Mobile: ……..

Email Address……

[Only display Q12 to participants who answered "No" to Q1]

14. If you are interested in the online information sessions, please leave your email address and we will send this information to you.

First name: …….

Surname: …….

Email Address……

END OF SURVEY

Consumer: General Welcome

"Thank you for coming along today and participating in our study. My name is XXX.

Acknowledgement of Country

Bathrooms, fire exits.

The purpose of this workshop is to capture the needs of the Rouse Hill community and their perspectives on new ways of delivering acute care. What we talk about today will inform the development of the new hospital in Rouse Hill. We really appreciate your time and thank you very much for being here today.

Consumer stream: As consumers of healthcare, your experiences as patients are very valuable. However, please note that there is no obligation to disclose details of personal healthcare issues.

Throughout the workshop a researcher/facilitator will be with each table group to take notes, facilitate discussion and ask you questions. The workshop will go for 2 hours with a 10-minute break with refreshments after the first hour."

Audio-recording devices, flipcharts, and notes will be used to capture discussions. You will remain unidentifiable in the analysis and write-up of any findings relating to this research.

If you have any questions throughout the day, please ask one of the Macquarie University staff members (**introduce all staff members**).

Before we begin, we ask that your read and sign the PICF on your tables. If you have any questions before signing, now is the time to ask (**pause for questions**). Once you've signed, we will photocopy the documents and provide you with your own version."

Group Introduction

"Good afternoon (morning/evening etc.) and welcome to the workshop. Thanks for taking the time to talk with us about what you would like to see in the new Rouse Hill Hospital. My name is (**insert name here**), and I am from the Australian Institute of Health Innovation at Macquarie University. We are working in partnership with Health Infrastructure and the Western Sydney Local Health District. My role as moderator will be to guide the discussion today.

Please note that there are no right or wrong answers but rather differing points of view. Please feel free to share your point of view even if it differs from what others have said. You don't need to agree with others' opinions, but we ask that you listen respectfully as others share their views.

You've probably noticed the microphone. We are taping the session because we don't want to miss any of your comments. People often say very helpful things in these discussions, and we can't write fast enough to get them all down. However, to make the recording as clear as possible, we ask that only one person speak at a time. And to remind you, no-one is identifiable on the recording.

Let's get started! Before we begin, if you wouldn't mind writing your name on the (name card/sticker in front of you. We will be on a first name basis today, but we won't use any names in our reports."

Icebreaker Activity

"To get everyone thinking, we have planned a brief icebreaker activity. The purpose of this activity is to encourage thinking outside of the box.

- As a group, let's try to come up with 15 different ways that you can use a paperclip. The more inventive, the better. Who would like to start? We have 3 minutes!

(Separate sheet of paper)

As some of the models of care involve understanding technological devices

Please rate on the scale below the following:

1. **How comfortable are you using:**

A smart phone?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

A smart watch?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

Computers?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

"Now that we have gotten to know each other a little better we would like you to reflect on a patient or patients who may or may not benefit from different "models of care". Today, we will talk about three different models of care in our workshop today. These are not the only models of care we are exploring, but we only have two hours, so will be talking about different models with

different groups. We are interested in your ideas and would like you to reflect broadly as well as on your experience as a person who may or may not benefit from these three different "models of care".

Model 1: Ambulatory Care and diagnostic hospitals: Non-admitted services, where patient care does not involve an overnight stay and usually involves diagnosis and treatment on the same day.

SHOW images: Home vs. Hospital (Images 1/2)
Maria (Image 3)

Your name is Maria and you are a 45 year old patient who is able to walk unaided and travels to a centre for treatment 2-3 times per week (e.g., renal dialysis in a shopping centre, chemotherapy)

We would like to ask questions from Maria's as well as your own perspective. Let's start with Maria:

From Maria's perspective:

1. **What is good about this model for Maria?**
2. **What about this model might make it difficult for Maria?**

Additional prompts

Can you think of anything about it that might be impractical?

Can you think of anything about it that might be unachievable?

3. **What needs to be in place for this to work for Maria?**

For example, systems, processes, people, skills and equipment?
Now from your perspective:

4. **What about this model might be good for you and your family?**
5. **What about this model might make it difficult for you and your family?**

Additional prompts

Can you think of anything about it that might be impractical?

Can you think of anything about it that might be unachievable?

6. **How easy is this to use for you?**
7. **What would stop you using it?**

8. **Can you think of other people who would have difficulty using this model?**

9. **We have already asked for Maria but what other things needs to be in place for this to work for you?**

   For example systems, processes, people, skills and equipment

General questions:

10. **Is there anything about the model that concerns you?**
11. **Can you see any safety issues for yourself?**
    - Why is that?
    - *Can you suggest a better way?*

(Additional prompts)

Are there any potential risks that you can identify?

12. **What other illness and injuries might this model work for?**

Model 2: Digital Hospitals/Consumer Focused Care

Hospitals that make extensive use of new technologies to provide streamlined care, improve patient safety and care quality, and improve overall care cost effectiveness.

SHOW images: Home vs. Hospital (Images 1/2)
John (Image 4)

John is an 70-year-old man who has a heart condition that causes dizziness (e.g., irregular heartbeat). As this places him at a high risk of falls, he has been admitted to hospital for monitoring. Beside his bed is a digital matt that detects and alerts the staff if he has had a fall.

Repeat questions

Model 3: Hospital in the Home

Patient care and consultation which is typically delivered in the hospital settings is delivered to patients in their own home (e.g., intravenous therapy (antibiotics), anticoagulation, wound care, and chemotherapy).

SHOW images: Home vs. Hospital (Images 1/2)

Jenny (Image 5)
Jenny is a 35-year-old, single mother of three who developed a breast infection with an abscess following the birth of her baby. She was treated with intravenous antibiotics (on a drip) and a tube was placed into her breast to drain the infected fluid. After 24 hours, she returned home to her children and is provided wound care and support in her home from a visiting nurse.

Repeat questions

At end of focus group

Concluding remarks: Now that we have come to the end of the workshop, we'd like to ask you:

How important is it for you to be able to choose a model of care?

Prompt: What if you have no option to choose? (only use if needed)

From your perspective, please rate your preference for each model: (Note: Models X, Y, and Z will be replaced with the relevant models discussed at each workshop).

Model X	No pref	Neither suitable	Model Y
Model Y	No pref	Neither suitable	Model Z
Model Z	No pref	Neither suitable	Model X

Is there anything else you would like to communicate to us about the new hospital?

Concluding remarks:

We will be looking at your data to find commonalties between consumers.

We are conducting exploratory research to gather information only, and all models may not be implemented. Thank you for your time.

Note: All images were publicly available and downloaded from Google.

Provider: General Welcome

"Thank you for coming along today and participating in our study. My name is XXX.

Acknowledgement of Country

Bathrooms, fire exits.

The purpose of this workshop is to capture the needs of the Rouse Hill community and their perspectives on new ways of delivering acute care. What we talk about today will inform the development of the new hospital in Rouse Hill. We really appreciate your time and thank you very much for being here today.

As providers of healthcare, your experiences as patients are very valuable. However, please note that there is no obligation to disclose details of personal healthcare issues.

Throughout the workshop a researcher/facilitator will be with each table group to take notes, facilitate discussion and ask you questions. The workshop will go for 2 hours with a 10-minute break with refreshments after the first hour.

Audio-recording devices, flipcharts, and notes will be used to capture discussions. You will remain unidentifiable in the analysis and write-up of any findings relating to this research.

If you have any questions throughout the day, please ask one of the Macquarie University staff members (**introduce all staff members**).

Before we begin, we ask that your read and sign the PICF on your tables. If you have any questions before signing, now is the time to ask (**pause for questions**). Once you've signed, we will photocopy the documents and provide you with your own version."

Individual Group Introduction

"Good afternoon (morning/evening etc.) and welcome to the workshop. Thanks for taking the time to talk with us about what you would like to see in the new Rouse Hill Hospital. My name is (**insert name here**), and I am from the Australian Institute of Health Innovation at Macquarie University. We are working in partnership with Health Infrastructure and the Western Sydney Local Health District. My role as moderator will be to guide the discussion today.

Please note that there are no right or wrong answers but rather differing points of view. Please feel free to share your point of view even if it differs from what others have said. You don't need to agree with others' opinions, but we ask that you listen respectfully as others share their views.

You've probably noticed the microphone. We are taping the session because we don't want to miss any of your comments. People often say very helpful things in these discussions, and we can't write fast enough to get them all down. However, to make the recording as clear as possible, we ask that only one person speak at a time. And to remind you, no-one is identifiable on the recording.

Let's get started! Before we begin, if you wouldn't mind writing your name on the (name card/sticker in front of you. We will be on a first name basis today, but we won't use any names in our reports."

(Separate sheet of paper)

As some of the models of care involve understanding technological devices

Please rate on the scale below the following:

2. **How comfortable are you using:**

A smart phone?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

A smart watch?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

Computers?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

3. **What proportion of your patients would be comfortable using:**

A smart phone?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

A smart watch?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

Computers?

Extremely Uncomfortable, Somewhat Uncomfortable, Neutral, Somewhat Comfortable, Extremely Comfortable

4. **So that we can understand you a bit better, what is your discipline?**

5. **Are you mostly:**

   Office based, facility based, a combination of both?

6. **What main problems do you currently encounter around delivering high quality care?**

7. **Can you suggest ways to overcome? (5 minutes)**

8. **What are you looking for in a new hospital?**
For example: IT/Scheduling/Accessibility

"Now that we have gotten to know each other a little better we would like you to reflect on a patient or patients who may or may not benefit from different "models of care". Today, we will talk about three different models of care in our workshop today. These are not the only models of care we are exploring, but we only have two hours, so will be talking about different models with different groups. We are interested in your thoughts about each of these models of care from your perspective and your patients' perspective. Some of these scenarios describe models you may have already encountered or engaged with. We would like you to think broadly."

Model 1: Ambulatory Care and diagnostic hospitals/ **Consumer Focused Care**
Non-admitted services, where patient care does not involve an overnight stay and usually involves diagnosis and treatment on the same day.

Maria is a 65 year old patient who is ambulant and travels to a facility for routine care 2-3 times per week (e.g., renal dialysis, chemotherapy)

Please answer the following questions:

1. **In an ideal world, how would her care be delivered?**

   Additional prompt: how could you best model this?

   From your perspective:

2. **How would this model help to solve the big problems for you? (What are the pros/strengths for you?)**

3. **What barriers limit this model for you?**

4. **What enablers would need to be in place for this to work?**

From your patients' perspective:

5. **How would this model help to solve the big problems for your patients?**
6. **What might be the pros/strengths?**
7. **What barriers might limit this model for your patients?**
8. **What enablers would need to be in place for this to work?**

General questions:

9. **What proportion of your patients would this model work for?**

Low – Mid – High

10. **Can you think of anything about it that might be impractical?**
11. **Can you think of anything about it that might be unachievable?**
12. **To what extent could this model be applicable to other health conditions? What conditions?**
13. **Can you think of any clinicians or patients who might find this model of care difficult to access?**
14. **Is there anything about the model that concerns you?**
15. **What might be the safety issues for your patients?**
16. **Do you see any risks to you as the healthcare provider?**

(Additional prompts)

Are there any potential risks that you can identify?

- *"Why is that?"*
- *Can you suggest a better way?*

Model 2: Digital Hospitals/Consumer Focused Care

Hospitals that make extensive use of new technologies to provide streamlined care, improve patient safety and care quality, and improve overall care cost effectiveness.

You are in a place you usually work at, and the facility has digital technology in place such as intravenous fluid charts, bed sensors to alert staff that a patient needs moving in bed, floor mats that alert staff when patients are out of bed, and interactive monitors for patients and staff about daily schedules.

Repeat questions

Model 3: Hospital in the Home

Patient care and consultation which is typically delivered in the hospital settings is delivered to patients in their own home (e.g., intravenous therapy (antibiotics), anticoagulation, wound care, and chemotherapy).

Your patient has undergone a procedure or surgery and after treatment in the hospital is discharged home for follow-up care. For example: Jenny is a 35-year-old, single mother of three who developed complicated mastitis with an abscess following the birth of her baby. She was treated with intravenous antibiotics and a drain was placed into the abscess. After 24 hours, she returned home to her children and is provided wound care and support from a nurse.

Repeat questions

At end of focus group

Thinking broadly, from your perspective, please rate your preference for each model: (Note: Models X, Y, and Z will be replaced with the relevant models discussed at each workshop).

Model X	No pref	Neither suitable	Model Y
Model Y	No pref	Neither suitable	Model Z
Model Z	No pref	Neither suitable	Model X

Thinking broadly, from your patients' perspective, please rate your preference for each model:

(Note: Models X, Y, and Z will be replaced with the relevant models discussed at each workshop).

Model X	No pref	Neither suitable	Model Y
Model Y	No pref	Neither suitable	Model Z
Model Z	No pref	Neither suitable	Model X

Concluding remarks:

We will be looking at your data to find commonalties between providers.

We are conducting exploratory research to gather information only, and all models may not be implemented. Thank you for your time.

Thank you for agreeing to allow us to contact you for a follow up call to talk about the findings of the discussions. The purpose of this phone call is to expand on areas of interest and verify the findings from the workshop data. What we talk about today will continue to inform the development of the new hospital in Rouse Hill. The discussion will be recorded so we can capture everything that is said.

You are free to withdraw at any time without consequence.

Do you have any questions before we start? (pause for questions).

For Model X, Y, Z , can you please elaborate on what you think is meant by….

For Model X, Y, Z, can you please elaborate on what you think is meant by….