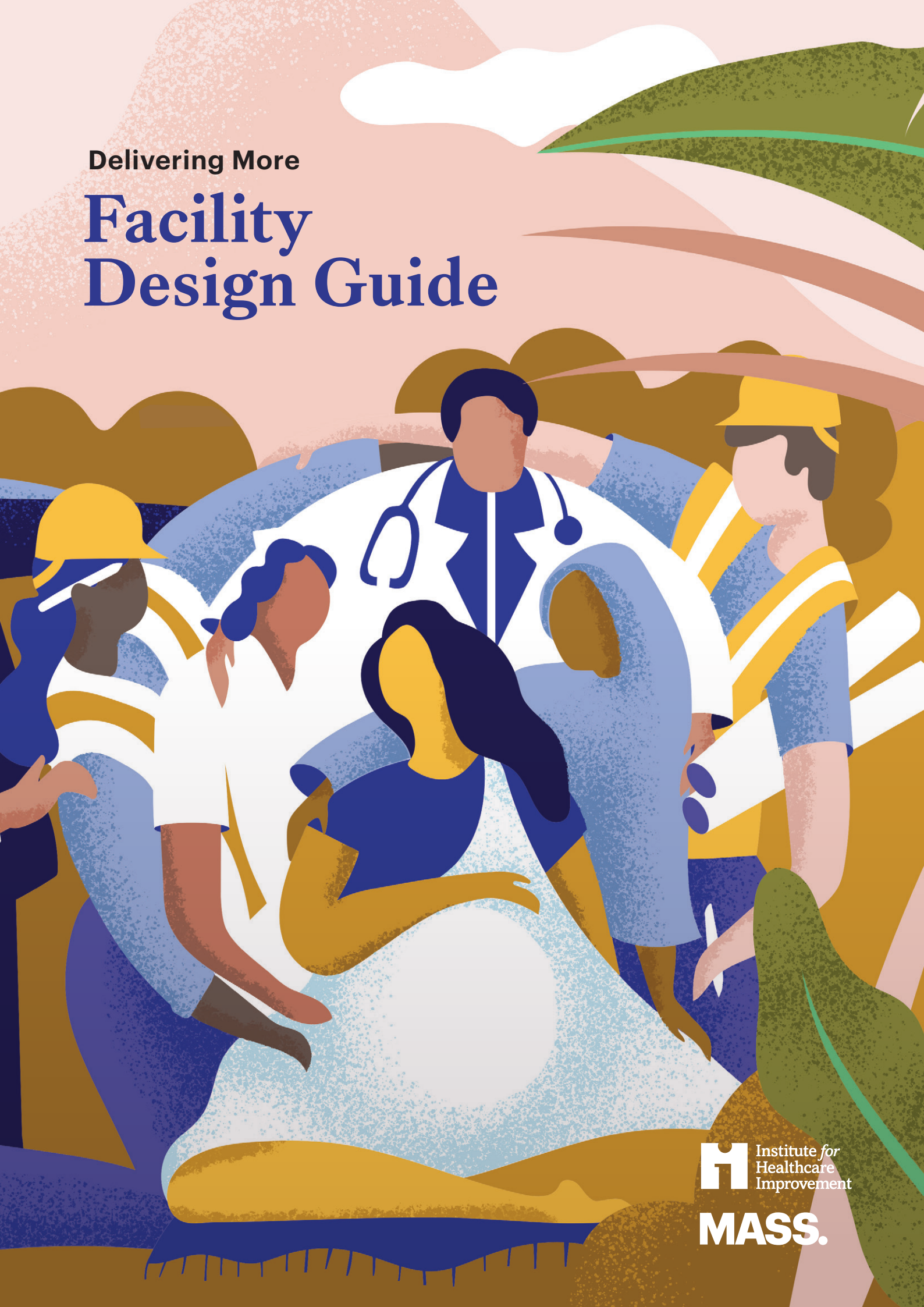
Delivering More

Facility Design Guide



Institute *for* Healthcare Improvement

MASS.

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The Delivering More project outlines a human-centred process to co-design ideal maternal care from the user perspective - with the aim of developing improved health facility designs that enable safe, respectful Maternal and Newborn Health (MNH) care provision and utilisation in traditionally underserved populations. With support from the Gates Foundation and the Elsa & Peter Soderberg Charitable Foundation, the project was led by the Institute for Healthcare Improvement (IHI), a not-for-profit organisation with a mission to improve health and health care worldwide. IHI partnered on the project with MASS Design Group — a nonprofit design, research, and engineering firm with extensive experience designing and implementing impact-driven health care infrastructure.

Based on learnings from the immersions in Ethiopia and Bangladesh, we have developed a globally-applicable toolkit and a set of guiding principles for improving maternal and newborn facility design.

Project Lead

Institute for Healthcare Improvement

Project Partner

MASS.

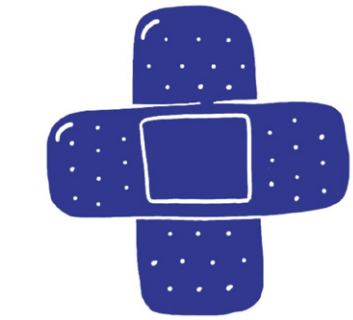
About this Guide

This guide is intended to take the reader through the process of designing improved Maternal and Newborn Care (MNC) spaces. It frames key stages in the design process and explains which stakeholders should be engaged, when important decisions need to be made, and how designs should be iteratively developed with feedback.

Human-Centred Design (HCD) can yield insights that lead to better outcomes. By listening, learning, and co-designing alongside stakeholders, designers can arrive at innovative and impactful solutions that resolve existing needs and elevate expectations of care. The journey to innovation may require design teams to tread and retread paths and ask questions they didn't know needed to be asked. This process guide aims to share learnings from our efforts to co-design improved maternal and newborn care spaces in Ethiopia and Bangladesh and seeks to provide a simplified roadmap for a journey that will ultimately deliver more to end users.

Aiming Long Term

You are likely using this guide to design a maternal-newborn care space that improves on the status quo. To create meaningful impact, however, it is important to weigh both short- and long-term needs.

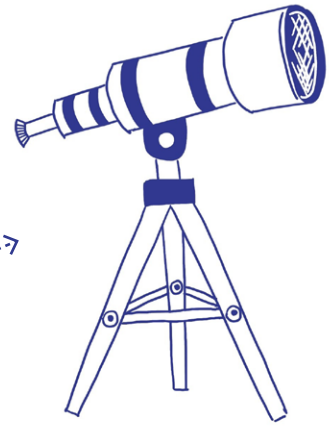


The Risk of Short-Term Solutions

There are many reasons why health infrastructure can fail to meet stakeholder needs and serve its full potential. While budget and resource constraints are a significant hurdle in most global contexts, other contributing factors include a lack of collaboration and the tendency to rely on short-term solutions.

Facility interventions are often implemented in a 'patchwork' manner, leading to short-term, ad hoc interventions that do not lead to substantial improvements in the quality or experience of care. For example, architects might be tasked with redesigning a space without having a full understanding of the facility care flows or the stakeholder experiences which provide the impetus for redesign. Alternatively, facility administrators might be tasked with specifying the location and size of new maternal and newborn care units without fully understanding how space improvements could impact health outcomes or being empowered to think creatively about spaces.

Short-term fixes are sometimes necessary in instances where there are space and budget constraints which hinder ideal improvements. However, these fixes might not be the most effective use of available resources if they end up needing to be redone, expanded, or relocated, hwhich is often the case if there is not an overarching strategy for infrastructural improvements. Consequently, while short-term interventions may serve as a stopgap, they often fail to address the real and entrenched problems affecting the quality and experience of care.



The Case for Long-Term Thinking

To create meaningful and transformative change, designers, providers, and policymakers need to be able to champion longer-term approaches to improving maternal-newborn care. Although long-term interventions might involve more significant design work, building modifications, or space use, they have the potential to support more substantial care improvements. They may require larger up-front investment, requiring more advocacy and negotiation with funders and implementing partners, but they also present an opportunity for more far-reaching and replicable impact.

Importantly, any proposed facility design should strike a balance between outcomes that are aspirational enough to effect change and feasible enough to be realistically achieved. But by taking a step back, thinking about problems holistically, and aiming for more long-term solutions, this human-centred approach seeks to not just patch gaps in existing systems, but rather to uncover and harness larger opportunities for impact.

Health Infrastructure Objectives	**Short-term Solutions**	**Long-term Solutions**
'Untangle' care flows and improve programme adjacencies.	◯	✔
Provide sufficient beds accommodating the number of patients comfortably for the recommended length of stay.	✘	✔
Provide spaces that are important to stakeholders, but are often overlooked (e.g., spaces for cultural & religious practice and mobility during labour)	✘	✔
Consolidate the maternity programme for easy and efficient movement between stages of the birth journey.	✘	✔
Provide a framework for expansion/growth.	✘	✔

✔ *mostly/fully achieved* ✘ *not likely to be achieved* ◯ *partially achieved*

A Framework for Collaboration

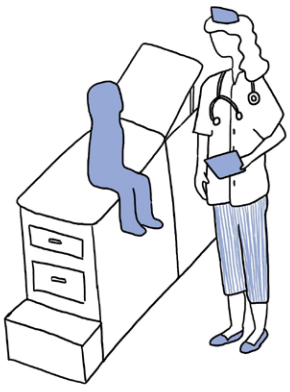
A variety of diverse and complementary stakeholders should be involved in any facility design project. Each team member brings a wealth of lived experience and must be engaged to create meaningful impact.

Architects & Designers

Architects and designers know how to design and build buildings, but may not be familiar with the details of health care delivery or understand what challenges need to be addressed. However, they bring a creative approach to problem solving and an ability to consider how spaces shape experiences, collaboration, and behaviors. They will be the ones ultimately responsible for translating feedback gleaned from the other stakeholders into buildable designs and should also champion a human-centred and inclusive design process.

Patients & Family Members

Patients & family members offer rich perspectives about what it is like to navigate health services and facilities. They can highlight barriers to access, care challenges, and needs from their first-hand experiences that providers and administrators may not be aware of and can also share ideas about what features and elements may improve utilisation, length of stay, quality of care, and experience. Some patients may be reluctant to provide critical feedback about care, staff, or spaces but should be encouraged to share honest feedback to improve future care experiences.



Health Care Providers

Health care providers have a deep knowledge of care delivery practices. They can provide detailed insight about how spaces are currently used and speak to the needs of patients, family, and staff. However, they are often not trained or empowered to think about the ways that space affects care; so they may need to be prompted to consider how the physical environment can improve care delivery, workflows, and experiences.

Facility Administrators

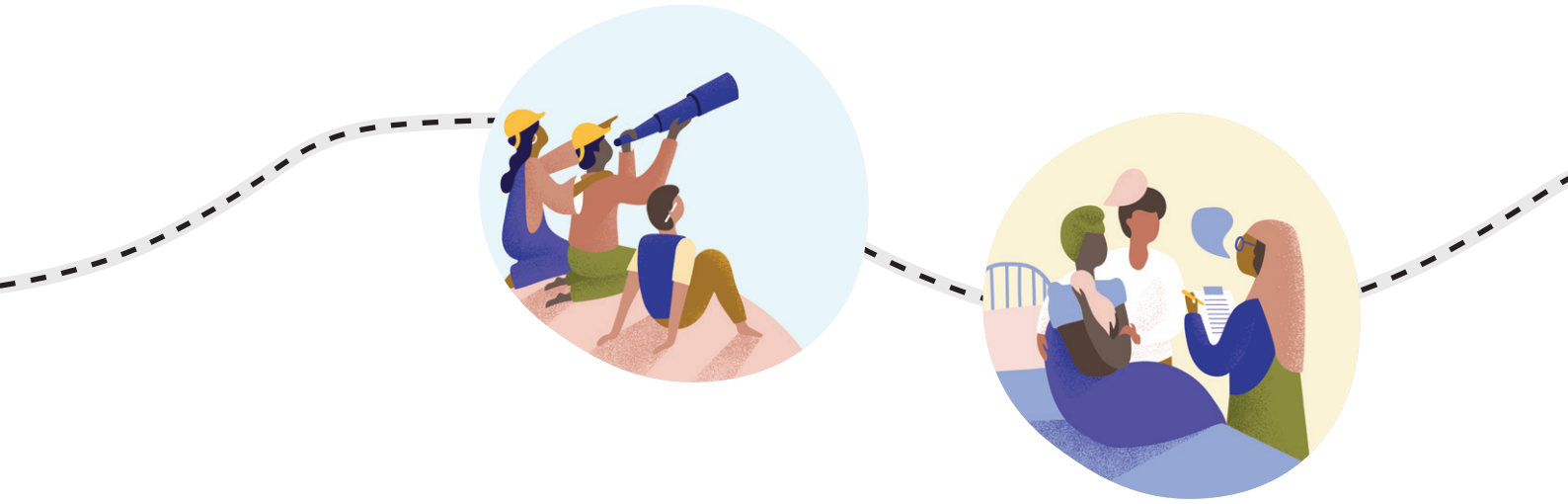
Facility administrators have the challenging responsibility of making improvements to health infrastructure and operations while balancing resource and budget constraints. Compared to providers, they may be less intimately familiar with how specific spaces are used, but they do bring knowledge of the challenges facing care units and programmes and how they relate at the facility level. They should help provide guidance around the placement, as well as footprint, of any space improvement project, but should also be encouraged to think more long term than short term.

Ministry of Health Representatives

MoH representatives have an understanding of broader targets and strategies for improving maternal-newborn health and priorities for investment. They also bring perspective on how infrastructure relates to systems, staff capacity building, as well as equipment and resource distribution at the national and district levels. They have many responsibilities and may be difficult to access, but getting Ministry of Health buy-in and feedback is critical to ensuring that any facility improvement project is appropriate and implementable.

Funders & Advisors

Funders and advisors often bring up-to-date knowledge and learnings about best practices in global care delivery and can share other relevant initiatives and resources, but they may be less familiar with regional care delivery norms and cultural nuances. Most are also not aware of the complexity and effort required to plan, design, and implement a capital project, which should be explained at the beginning of any new partnership or initiative. Funders and advisors should be consulted at key points to provide high-level feedback on the direction and scope of the project.



PHASE 1

Planning

The Planning stage is key to setting the project in motion and collecting the information necessary for the subsequent phases of the design process. This process involves asking questions and investigating possible solutions through engagement and iteration.

Page 7

PHASE 2

Engagement

The Engagement phase is focused on engaging end users. This phase is all about learning from stakeholders, recognizing both needs and opportunities, and leveraging a human-centred approach uncovering insights that will guide a more impact-driven approach to design.

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PHASE 3

Analysis

During the Analysis phase, you will interpret the data, experiences, and stories shared by users to develop learnings that will guide the next phase of design. The main goal of this phase is to reach greater clarity and consensus about how design could improve the current-state condition.

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PHASE 4

Design

The Design phase is focused on the development of design solutions informed by engagement insights. Design concepts should be reviewed and iterated upon with feedback from the broader stakeholder team to ensure they are aligned with needs.

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PHASE 5

Implementation

After space improvements are made or construction is completed, the team should reflect on learnings, develop adapted approaches, and share knowledge with others. These steps are necessary for replicating and scaling impact and ensuring the process can be continued.

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PHASE 1

Planning

What

The Planning stage is key to setting the project in motion and collecting the information necessary for the subsequent phases of the design process. Human-centred Design (HCD) is a mindset that acknowledges that even as experts in our profession, we do not know everything, nor do we have answers to all the challenges. This process involves asking questions and investigating possible solutions through engagement and iteration.

Who

It is time to assemble a team with a diverse set of expertise. You should have a team comprised of architects and designers, engineers, health providers, Ministry of Health (MoH) representatives, and other implementing partners.

- It is important for some members of this team to be familiar with the local context, language, and culture.
- A successful HCD team should think about implementation from the start of the project, and thus, it is necessary that local representatives who are responsible for the construction and maintenance of health care facilities be involved from the onset. Local representatives may include MoH representatives at the national or regional level, facility administrators, health providers, or community leaders.

Outcomes

By the end of this phase:

- You should have conducted a literature review and read through the Design Principles document.
- Your project team should be oriented with a strong understanding of the project mission.

1.1 Assembling a Team

A variety of stakeholders will need to be involved in the process, but at different points and to different degrees. Usually a team will be made up of the following:

Core Team

The core team is a smaller group of people working on the project directly. It should include an implementing partner such as a Non-Governmental Organisation (NGO) or government organisation such as the Ministry of Health (MoH) that brings knowledge of the health system, as well as architects and engineers who will carry out the user engagement activities and design production. This team will usually meet weekly and be responsible for running and managing the project on an operational basis, as well as liaising with MoH and funders/ advisors for feedback.

A core team could be comprised of: 3-4 architects, 1 structural & geotechnical engineer, 1 civil engineer, 1 MEP engineer, and at least 2 individuals with health care or health systems experience.

Contributors

Contributors are individuals who participate at strategic points in the process to provide feedback. These may include facility administrators, providers, end users (e.g., patients and family/companions), or MoH representatives (if working with them less directly). They are usually heavily engaged upfront during the immersion process, but it is also important to involve them at the design stage to seek their feedback.

Advisors

Advisors are convened on a less frequent basis to provide high-level input and suggestions. Advisors bring their extensive experience and expertise to help inform the direction of the project, but provide minimal time investment and do not work directly on the project deliverables.

Case Study

For the **'Delivering More' project**, the Bangladesh Ministry of Health & Family Welfare (MoHFW) was a contributor to a process led by Institute for Healthcare Improvement (IHI) and MASS Design Group. IHI engaged MoHFW representatives at the beginning of the project to identify facility sites for improvement and later hosted two formal workshops with them during the design stage. The first workshop was planned early on in the design process, and we presented our HCD engagement approach and learnings, as well as concept design options for 3 scales of design interventions: short-, medium-, and long-term options. The second workshop was late in the design process, at which point we presented the final designs and sought to get support for implementation.

We additionally assembled a Global Steering Committee composed of representatives from INGOs working in maternal and newborn care improvement. Our advisors were key to ensuring buy-in, applicability, and accessibility of the project. We engaged with them through the following virtual conference calls:

Session #1 - A kickoff meeting to introduce our project aims and scope.
Session #2 - A presentation of engagement findings from Ethiopia and Bangladesh.
Session #3 - A presentation of our conceptual designs.
Session #4 - Review of draft project deliverables.

ACTIVITY

Stakeholder Mapping

This activity is intended to identify different stakeholders and how they may be impacted by the project.

Description
Stakeholder identification is used to understand who will be affected by a project, who should be involved in the design process, how they can influence project outcomes, and what perspectives and interests they will bring. It will help you develop an appropriate approach to stakeholder engagement and craft a strategy for negotiating among competing interests during the participatory process.

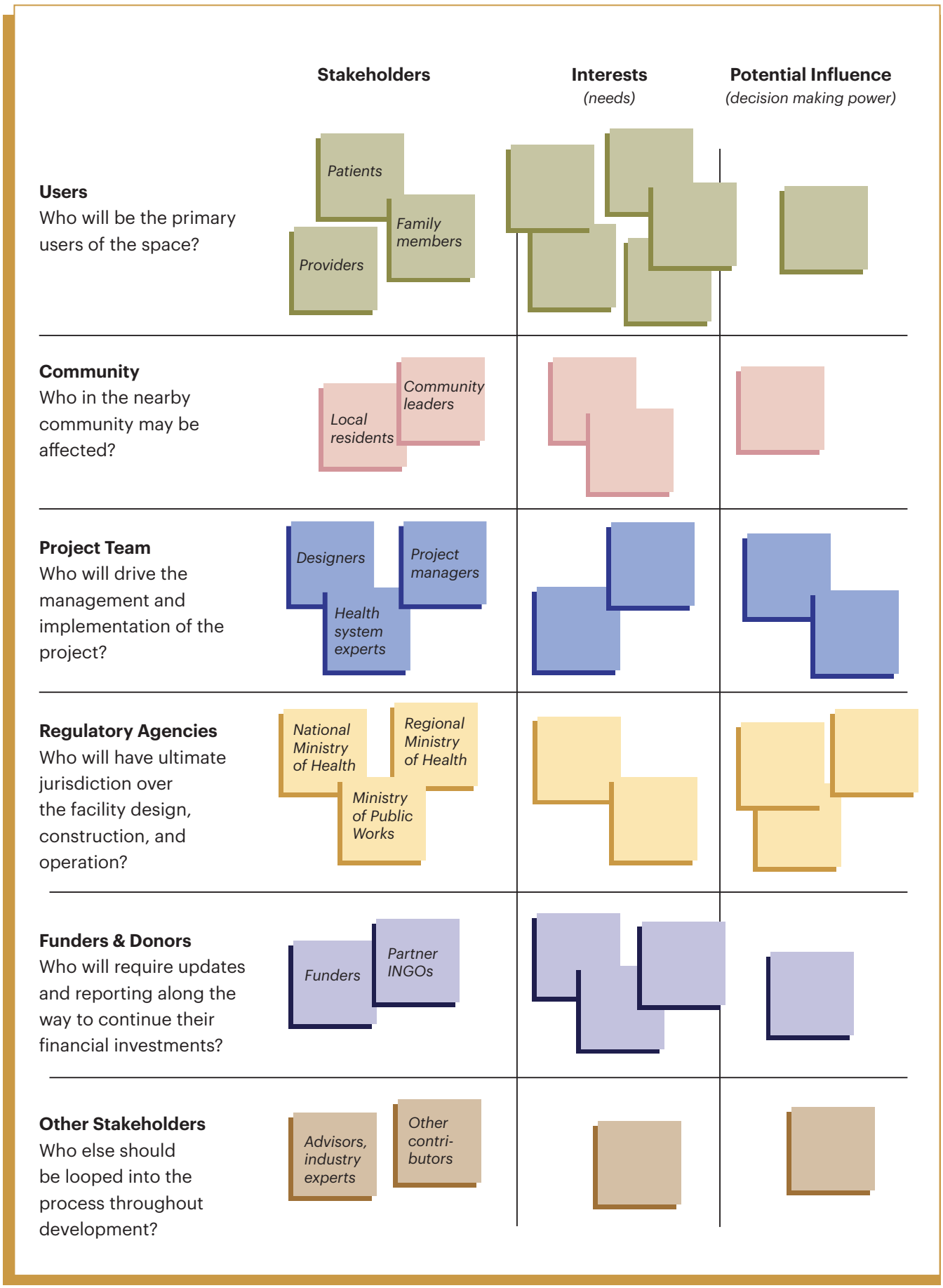
When to use
Stakeholder identification should be done early on, at the kickoff of a project, so that it can inform your understanding of the context and preparations for on-site engagement. It is a living document that will be continually developed as the team gains new knowledge.

Tips
Diagramming stakeholder relationships can provide an understanding of how stakeholders relate to each other and can inform who to meet with and at what stage of the project.

Use the template on the next page to analyze stakeholder types and roles.

How to do the activity

1. Identify and categorize stakeholders based on their relationship with the project, using the categories to the right. Some examples of possible stakeholders have been included, but make sure to customize these as applicable to your project and provide greater specificity.
2. Discuss each stakeholder's interests in the project: what their needs are, what they want to see happen or not happen, what they stand to win or lose.
3. Evaluate each stakeholder's power to make project decisions and their capacity to influence the project through political power, financing, patronage, or availability of other resources.
4. Use the analysis to inform the participatory process and design stakeholder engagement. Decide which stakeholders will be selected to participate in particular workshops or activities.


Stakeholders
Interests
(needs)
Potential Influence
(decision making power)
Users
Who will be the primary users of the space?
Patients
Family members
Providers
Community
Who in the nearby community may be affected?
Community leaders
Local residents
Project Team
Who will drive the management and implementation of the project?
Designers
Project managers
Health system experts
Regulatory Agencies
Who will have ultimate jurisdiction over the facility design, construction, and operation?
National Ministry of Health
Regional Ministry of Health
Ministry of Public Works
Funders & Donors
Who will require updates and reporting along the way to continue their financial investments?
Funders
Partner INGOs
Other Stakeholders
Who else should be looped into the process throughout development?
Advisors, industry experts
Other contri-butors

1.2 Critical Reflection

After assembling your project team, it is time for work to start in earnest! It's important in this phase to assess assumptions and to build and share a larger base of knowledge. It involves stepping back and asking "what do we think we know?" as well as "what more do we need to learn?"

Get familiarized at a high level

To gain a baseline understanding of how space can improve the quality and experience of maternal-newborn care, please read the ***Design Principles.*** Here are some suggested additional readings if you'd like to learn more:

- Oladapo, et al. "WHO model of intrapartum care for a positive childbirth experience"
- WHO. "Standards for improving the quality of maternal and newborn care in health facilities." 2016
- Helena Sandman, et al. "Unboxing empathy: reflecting on architectural design for maternal health." CoDesign. 2020

Build a base of context-specific information

Conduct a desktop literature review to consolidate learnings from existing studies and projects and expand the team's understanding of current childbirth practices in the project context.

There are very few academic studies looking directly at the relationship between space and outcomes, but you may uncover other helpful information such as perceptions around childbirth care or common challenges existing in childbirth facilities in your region.

Also look for relevant reports and standards from the MoH, such as:

- Documents outlining strategic targets or priorities for maternal-newborn care or strategies that may determine infrastructure investments.
- Facility standards, guidelines, or prototypes for hospital or health centre design
- Guidelines for the design of specific spaces – e.g., Neonatal Intensive Care Unit (NICU) design requirements

To narrow down your search, consider combining the following search terms: (country name), childbirth, birth facility, maternal care, space, environment, facility design, mothers, experience, utilisation, quality, perception, and culture.

Share knowledge with the project team

For an effective project kickoff, team members with deep contextual knowledge about maternal-newborn care (such as the implementing partner) should prepare a presentation that provides a grounding understanding of care delivery practices and priorities to the rest of the team. The presentation should seek to provide the following information:

MNH Services

- Broadly speaking, what maternal-newborn care services are included at different facility levels in the country context? (E.g., health centre, primary hospital, regional hospital).
- At the selected facility(ies), what maternal-newborn care services are currently offered?
- Include photos showing various maternal-newborn care spaces in the facility (from entry and waiting spaces, to labour, delivery, postpartum, etc.).

Care and Cultural Practices

- What are the general patient demographics in the area, and how might they affect care needs or norms?
- Which companions typically accompany women to facilities, and what role do they play in care?
- What is the influence of religious or cultural practices on childbirth care and patient experience?

Challenges and Opportunities

- What major challenges or needs do you anticipate finding at the facility(ies), based on the literature review or past experiences?
- What design interventions do you anticipate will offer the largest opportunities for improved care?

MoH Initiatives and Priorities

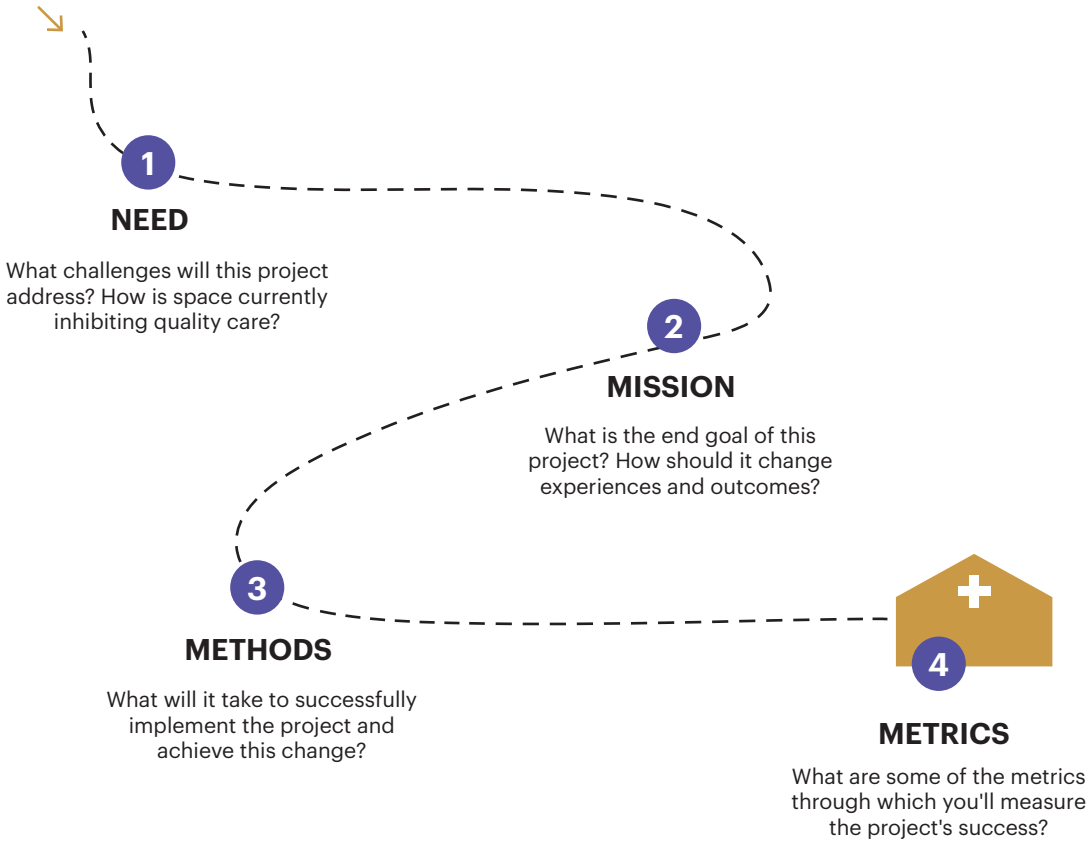
- What are the ministry's initiatives and priorities related to maternal-newborn care at a national level?
- Are there any strategic plans for infrastructure upgrading? (For example, is there a plan to roll out Kangaroo Mother Care at every health centre by a certain time, or a plan to upgrade many health centres into primary hospitals?)

1.3 Planning for Impact

As part of the project kickoff, the core team should conduct visioning and grounding exercises to establish a "north star" for the project. This can be done through interactive workshops held in-person or virtually. You may consider presenting the outcomes of these workshops to funders and advisors.

Project Visioning

As a group, identify the needs, as well as the aspirations, that will drive the project. You may not have complete clarity on all the answers early on, but it is still helpful to take a first pass at this exercise at the project's commencement. You should come back and take another pass at articulating these answers after doing user engagement.



Project Grounding

The project team should do a grounding exercise at the start of the project to make sure that everyone is on the same page about the scope and scale of the intended intervention. These answers may evolve as the project develops and as you engage stakeholders, but it is helpful to establish a clear direction for the project at the beginning. Here are some key questions to explore and considerations to keep in mind:

What facilities will be targeted?

- A project aimed at improving multiple facilities at once will require more effort and coordination, but also can achieve some design efficiencies and synchronies if there are similarities or overlaps between facilities.
- What are some of the big constraints or opportunities that this facility presents? Note any initial instincts about whether a renovation or new construction will be the aim.
- Does this facility represent a fairly typical care environment in the country context, or is it unique? Is there an intention for the design intervention to be replicable?

How will you bound the scope of the intervention?

- Will the focus just be on maternal and newborn care or will the intervention also involve other care departments?
- Will the interventions target just inpatient or also outpatient services?
- Since the infrastructure/building systems (i.e., water, electricity, waste) are tied to the rest of the facility, how will you deal with larger improvements, as it is difficult to isolate building systems for maternal-newborn services? Whose responsibility will it be to address larger improvements?

What types of design will be included?

- A full system redesign does not only include built space design such as architecture, engineering, and landscape, but also interior design and wayfinding, furniture and equipment, communication design, staffing/capacity building improvements, and transportation.
- Will space improvements work in tandem with other systemic improvements? If not, how will insights and ideas the team comes across be passed along to the necessary stakeholders?

If you haven't yet identified a facility for improvement, consider the following:

- *The degree to which a facility represents an existing standard or prototype will determine if learnings and resulting designs are replicable.*
- *Investing in a facility that has fundamental issues (and may need to be relocated long term) may not be a prudent use of resources.*
- *A crowded and spatially-constrained facility might not provide sufficient space to expand and improve health outcomes.*

PHASE 2

Engagement

What

The Engagement phase is focused on engaging end users. This process is all about learning from stakeholders, recognizing challenges, and opening up to opportunities. While the research conducted in the Planning phase may be generally accurate for the given context, some user engagement is necessary to reaffirm, adjust, or add to these findings. A human-centred design approach is key to providing an intimate understanding of how people currently navigate and experience care and uncovering insights that will guide a more impact-driven approach to design.

During this phase, you will travel to the health facility and engage with various stakeholders such as mothers, family/companions, community members, and providers. Methods may include semi-structured interviews, facility walk-throughs, surveys, observation and shadowing, or workshops.

Who

The composition of the Engagement and Assessment Teams may vary depending on the facility type and the level of design included in the project scope:

- For a health centre, you should have a minimum of 2 team members engaging with stakeholders and 1-2 team members doing the technical assessment of the facility (preferably engineers)
- For a hospital, you should have a minimum of 3-4 team members engaging with stakeholders and 3 team members assessing the facility (preferably engineers)

Outcomes

The outcome of this stage is to have a better understanding of stakeholder needs, spatial challenges, as well as opportunities. By the end of this phase, the team should have a collection of raw data, including filled-out engagement and assessment tools, photographs, audio recordings, and current-state drawings.

2.1 Preparing for Engagement

Before visiting a facility, you'll need to identify what you aim to accomplish, who you'll be meeting with, and when. Your trip agenda may need to be adapted on the fly, but will help to structure an effective engagement process.

Who do you want to engage with?
Plan to engage with various stakeholders within the facility to get different perspectives, including stakeholders at different levels of involvement. You should talk with facility-level management to get a better understanding of the history of the facility and opportunities for improvement. We also suggest speaking with representatives from the local MoH to inform them about the project, discuss shared objectives, and learn more about how this intervention could feed into existing programmes and initiatives.

For example, a mother who recently gave birth through a Natural Vaginal Delivery (NVD) might have a very different experience with space compared to a mother who gave birth through a caesarean section.

How much time can you spend?
This is crucial because the time the team can realistically spend on-site will determine the number of engagement interviews, on-site other activities that you plan.

When is the best time to visit?
It is helpful to confirm with the facility the best time to make a visit. Make sure to be aware of holidays and seasonal events that may affect utilisation and care, as well as daily patterns such as what times of day are busy or slow. Facility staff will have advice on the best time to engage different user groups and how to approach mothers.

Postpartum mothers may be hard to engage, depending on their length of stay. Please respect their needs and preferences.

What languages do stakeholders use?
You may need to bring a translator if patients in the region speak a different language or dialect than the project team or providers. Translation will require extra time on the ground, as well as upfront training and practice to make sure the translator is conveying information accurately in both directions.

ACTIVITY

Scoping Checklist

This checklist contains a series of questions that should be answered before embarking on an engagement trip. It will help you make sure that the right opportunities are targeted upfront and that the resulting intervention is realistic and aligned with larger plans for the facility.

Maternal-Newborn Care

- ▢ What is the standard maternal-newborn space programme for this facility type? What services is this facility meant to provide?
- ▢ How many births per year does the facility currently experience? How many of those are caesarean sections?
- ▢ How long do women typically stay after birth? What should be the target?
- ▢ If there is a NICU programme, how many babies are admitted annually? How many of those are inborn vs outborn?
- ▢ How many maternity beds does the facility currently have? (This includes labour, delivery, and postpartum). What should be the target, considering the birth volume and desired length of stay?
- ▢ How many newborn beds does the facility currently have? (This may include NICU and Kangaroo Mother Care beds)
- ▢ Does the facility have a dedicated maternal-newborn care wing or building? Are there designated wards for maternity patients, or are they mixed into general female wards?
- ▢ Are there any plans to upgrade the facility level or expand MNH care services?
- ▢ What does the referral process look like in this context, for maternity patients as well as small and sick newborns? (Both to and from the facility)

Infrastructure

- ▢ Does the project team have access to site plans and as-built drawings for the facility?
- ▢ What is the age of the buildings that currently contain maternal-newborn care services? What improvements or interventions have been made over the last few years?
- ▢ Is there any ongoing or planned renovation or new construction happening at the facility?
- ▢ What portion of the facility or site footprint is available for an improved MNH department? Are there any buildings or areas that cannot be included for consideration?
- ▢ Is renovation, expansion, or new construction a possibility? Are any of these options off the table given site constraints or future building plans?

2.2 Leveraging the Tools

The 'Delivering More' Toolkit includes these two key resources. Make sure to leverage and adapt them as appropriate for your project.

Engagement Tool

This document is aimed at collecting insights from users. It consists of 17 distinct tools (a mix of surveys, interview and focus group guides, workshop protocols, observation guides, and a birth simulation), each designed to capture complementary information about childbirth experiences and how they are affected by the built environment. The tools are grouped by intended respondent (e.g., Mother, Provider, Community Member), but are designed such that they can be used in any order, depending on the team's data collection plan. While the text of the tools has been honed by our teams with an eye to the Ethiopian and Bangladeshi contexts, they are broad enough that they can and should be adapted by others.

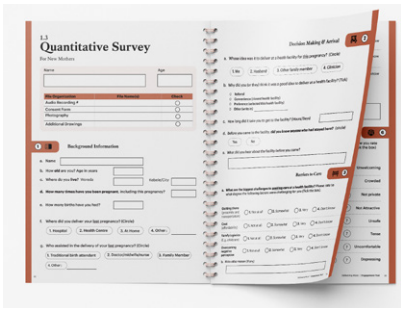
Assessment Tool

This document is aimed at evaluating the condition of existing buildings to inform decisions about renovation versus new construction. It includes sections dedicated to structural engineering, site topography, site accessibility, stormwater management, solid and medical waste, water supply, wastewater management, and electrical systems in order to build a comprehensive understanding of the facility's current state and potential for modification. Like the Engagement Tool, the Assessment Tool has been compiled with our local contexts in mind, but the tools capture critical information that – with minimal adaptation – would be important to understand in any location where this methodology may be applied.

User Engagement Methods

The Engagement Tool covers the following user engagement methods. It includes printable versions and templates of standard questions and exercises, as well as a poster that can be printed or copied for design workshops. The toolkit also includes a series of illustrations that can be printed as cards to be used as a visual reference for discussing different stages of maternity care with stakeholders.

Semi-structured Interviews



Quantitative Surveys

Facility Walk-throughs

Observation & Shadowing

Experience Simulations

Journey Mapping

Co-design Workshop

ACTIVITY

Pre-Engagement Checklist

As you get further into preparing engagement and assessment activities, here are some basic tips to ensure you have everything you need.

1. Review the engagement tools and adapt them based on the outcomes of the discussion above. You might want to conduct some, but not all, of the engagement activities provided. ☐
2. Get the necessary permissions to visit the facility and conduct user engagement. You may need to get approval from the MoH as well as facility administrators. An Institutional Review Board (IRB) process may also be required, depending on the extent of engagement planned and local protocols for human subjects research. ☐
3. Print the Engagement and Assessment Tools. You should print sufficient worksheets, interview and photography consent forms for the team to complete and assign each team member clear roles and responsibilities during the trip. ☐
4. Consider translating the Engagement and Assessment Tools into the local language or dialect ahead of time to ensure that translators do not have to spend time translating in real-time. ☐
5. Reconfirm permission before arriving at the facility, and make sure that facility administrators are aware of the project and its goals. ☐

2.3 Engaging End Users

Establishing a safe and comfortable environment before interviewing a stakeholder is as important as asking the right questions. Here are a few tips.

1. During the process, it is beneficial to be humble, listen, and invest time building rapport with an individual before launching into the interview.
2. It might be helpful to record the interview with an electronic audio recorder. Often, interviews progress quickly, and it might be challenging for an interviewer to note down every detail of an interviewee's statement. Note-taking during an interview is a process of distilling and summarising information, and it is entirely possible for slight nuances and details to get lost. From our experience in Ethiopia and Bangladesh, we found that having backup audio recordings of our interviews was helpful, as we could go back to those interviews during the analysis phase to identify specific quotes and anecdotes which might not have been written down in the Engagement Tool worksheets.
3. Ask permission before recording or photographing stakeholders and explain the reason for your request.
4. Take note of what is said and also what is not said. Patients may not be comfortable criticizing the care they received for fear of seeming ungrateful or other repercussions.
5. It is helpful to use visuals like illustrations or photographs when engaging with stakeholders – whether discussing experiences along the different stages in the care journey or trying to identify desired design features. This toolkit includes a series of MNH care journey illustrations, as well as facility precedent cards that you can refer to, but feel free to create your own!
6. Don't feel intimidated if you have never practiced Human-Centred Design before. Fundamentally, HCD is about making the time and space to listen to people, observe, as well as keeping an open mind to ask questions you didn't know needed to be asked and learn things you didn't know you needed to learn.
7. Prepare to be agile and flexible. While an immersion schedule is a helpful tool to manage your team's time, in practice, it is crucial to be respectful of the fact that you will be visiting a care facility where people are undergoing a major life experience of giving birth. In instances where mothers are tired or do not wish to speak, or if providers are busy tending to their care needs, you may need to reschedule interviews or other activities at a time that's convenient for them.

ACTIVITY

Trip Debriefing

Debriefing is a necessary activity which will help the project teams recollect and summarise key findings from their experiences on-site.

1. Spend time debriefing as a team. The cool down worksheets within this document are useful tools to use at the end of each day to document conversations and observations that stood out. Be prepared to share your thoughts with the team and hear what stood out to them as well.
2. Remember that quantitative data is only one aspect of an engagement outcome. Stories and experiences are the vehicles through which we can better understand how quantitative data (e.g., the number of beds at a facility) affects the user experience. The cool down worksheets are a great way to note down stakeholder stories and observations from the site which could help to frame challenges at a facility level.
3. An important note to consider: The process of debriefing is an important transition into the analysis phase. Take note of common themes in stakeholder responses.

Debrief Worksheet

1. Today I Met / Did...					
2. I was amazed to realize...					
3. I wonder if this means...					

PHASE 3

Analysis

What

During the Analysis phase, you will interpret the data, experiences, and stories shared by users to develop learnings that will guide the next phase of design.

Who

The Engagement and Assessment Teams will lead the effort of distilling the information gathered and should share the insights with the rest of the core team, including designers, as well as health systems partners.

Outcomes

The main goal of this phase is to reach greater clarity and consensus about how design could improve the current-statecondition of the facility. The end outcome could be an Engagement Report, which presents the learnings from stakeholders.

3.1 Organizing Data

After engaging end users on-site, the core team will need to parse through the raw data collected and organise it into an easily accessible and digestible format.

Digitize

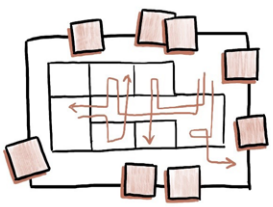
Digitize the stories and information collected on-site into an easily-digestible format through which the team can begin to read patterns and overarching themes.

Data Input Table

In a spreadsheet format, record the responses from stakeholders and organise these by stakeholder (mothers, family/companion, provider, etc.) and by activity (semi-structured interviews, quantitative surveys, etc.).

Organise Resources

Save photographs, scans of drawings, and audio recordings in a place that is accessible to the whole team and in a way that maintains the privacy and confidentiality of stakeholders.



Space Use Documentation

Annotate facility floor and site plans to spatially link the information you collected on-site with the various rooms that MNH patients visit along their care journey.

ACTIVITY

Filter Learnings

Debrief with the project team to highlight stories and learnings that stood out.

- Recognise key takeaways from each group of stakeholders and from each activity.
- Ask questions such as, 'what did we learn?' and 'how are the experiences of stakeholders spatially linked?'
- It might be useful to draw up a summary table for each activity using these categories.

What we heard

Start by pulling quotes directly from the stakeholder interviews and activities and title this column, "What we heard."

"If there were separate chairs for companions, they could sit down and take a little rest. Then they could have spent more time with me."

What we learned

Think about what this quote is telling you. Title this column, "What we learned."

Companions assist mothers both physically and emotionally and serve as auxiliary nurses. Mothers felt an extra sense of safety and confidence with their companions present.

What this means

Discuss this quote or a series of similar quotes in a team and think about how you can interpret this, i.e., What are the stakeholders alluding to?

Companions are an important part of the care team. The design of labour and delivery rooms should be more intentionally designed to accommodate companions.

3.2 Extrapolating Learnings

Informed by the outcomes of the 'Filter Learnings' activity, posit ideas for improvement and distill takeaways into a format that can be shared with others.

Questions

- What are the biggest obstacles facing stakeholders? How could these challenges be reframed as opportunities for intervention or improvement?
- How could design improve the quality and experience of care?
- What constraints, challenges, or contextual considerations need to be taken into account?

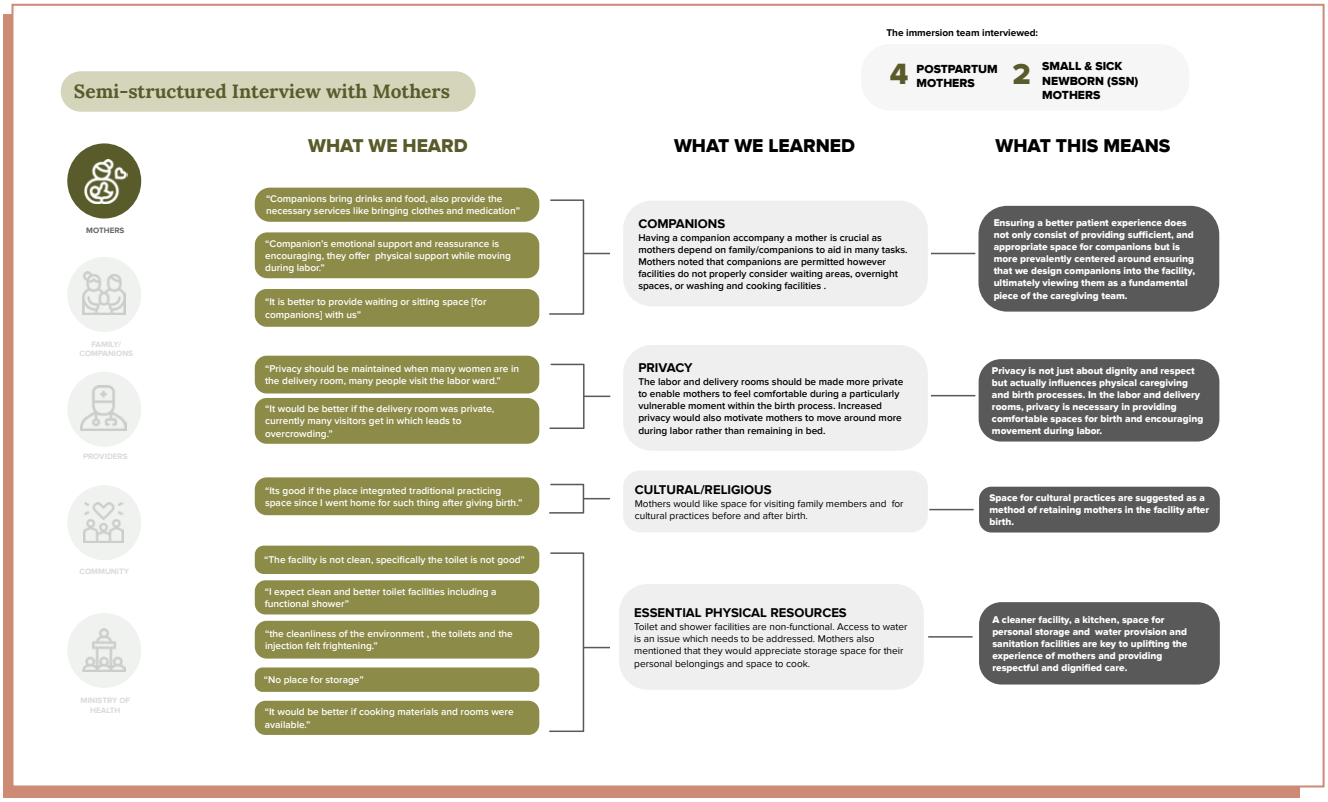
Tips

- Highlight any emerging themes and patterns in user responses. Some of these themes might include: access to care, emotional support, mobility, birth position of choice, respect and dignity, essential physical resources, community and connection, mother-baby dyad, and quality of care.
- In addition to drawing these larger mainstream themes, it is also important to acknowledge the experiences at the extremes.
- The thing about human-centred design is that it is just that — it's human-focused. Behind each statement is a person with very real and unique experiences, and it is therefore normal for the data not to present clear patterns. Some responses might be contradictory, and stakeholders might be split regarding their perspectives on different aspects of the care experience.

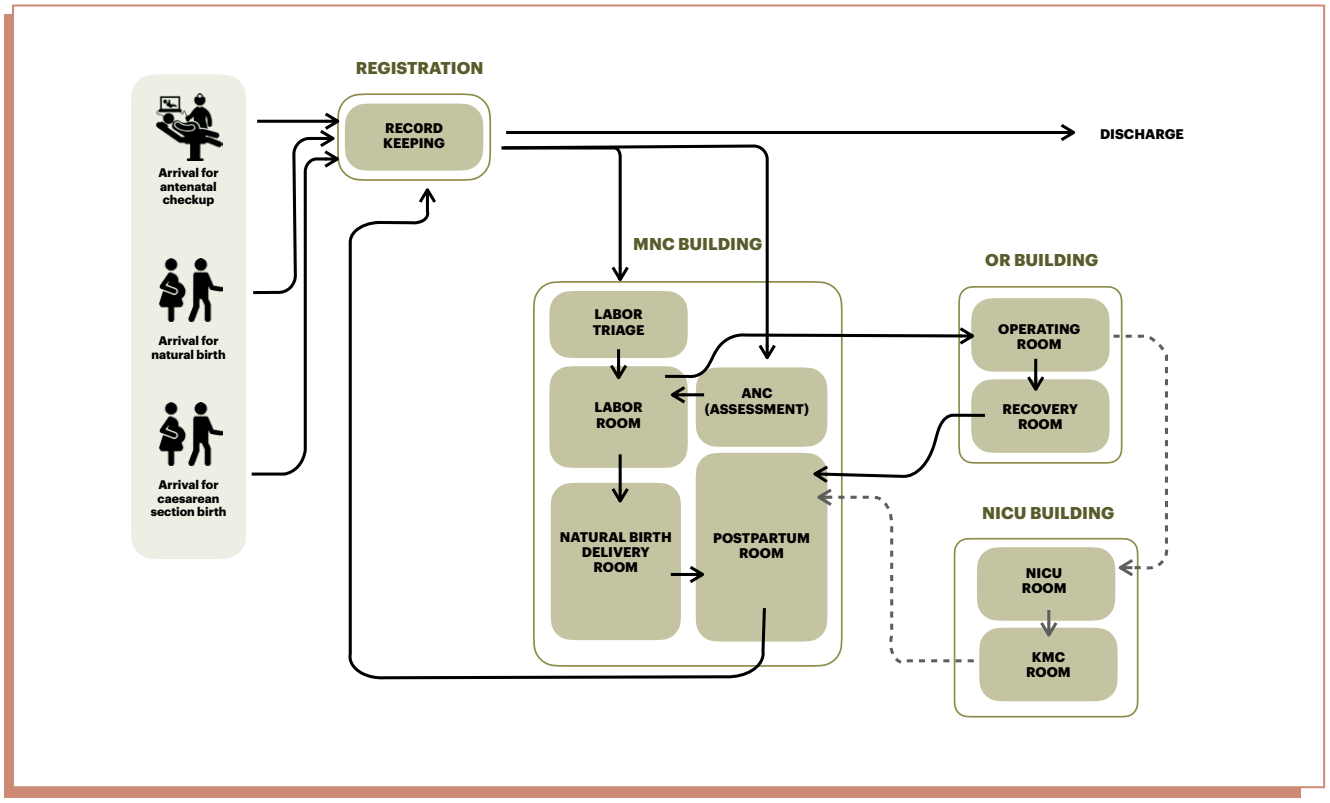
Formatting

It may be useful to distill these findings in the form of an engagement report, which can be presented or shared with project contributors and advisors.

- Consider including the results of the 'Filter Learnings' exercise, as well as care flow diagrams that illustrate the flow of patients between MNH programs in the current facility, and note bottlenecks and opportunities for improvement in the care journey.



Example learning summary



Example care flow diagram

PHASE 4

Design

What

In the Design phase, the team will translate the ideas that emerge from the Engagement and Analysis phases into a design for an improved space.

Typically, the design process is broken down into stages: programming, concept design, schematic design, design development, and construction drawings. These stages help provide benchmarks for iteratively advancing the resolution and level of design detail achieved. It is important to punctuate the design process with regular feedback from stakeholders, which may include implementing partners, Ministry of Health representatives, or facility administrators.

Who

The design professionals that are part of the core team will lead this work, but will regularly check in with the rest of the core team for progress updates and feedback. Regional stakeholders and representatives from the Ministry of Health should also be involved during the design phase to confirm that the project approach and space programme is both feasible and aligned with broader goals.

Outcomes

A drawing set consisting of plans, sections, elevations, and details necessary for construction implementation.

4.1 Distilling Design Inputs

The first step of the design process is to develop a clear set of design principles that reflect the care needs of your unique facility and context.

As a team, begin by reviewing the "Design Principles" document included in this toolkit. This document details our learnings from the Delivering More project in Ethiopia and Bangladesh and includes typical room layouts and space program ratios that might be helpful in the design process. Some of the information and design concepts shared will be applicable to your facility and context, but others may need to be adapted or approached very differently. Care delivery standards, cultural and religious practices, and gender norms will influence how people will interact and use spaces.

Next, you'll need to create a more refined set of design principles that are customized to your facility and context.

- Draft a list of specific design principles for your targeted facility that responds to the insights articulated in the Analysis phase. Feel free to replicate, adapt, or add to the broad principles we've included.
- Draw up a diagram describing the ideal care flow of patients between MNH programs in the future facility and note space features key to improving the care journey. Make sure to consider every step in the process, from the moment patients arrive at the facility to the moment they leave.


The 'Delivering More' Toolkit
Design Principles


DESIGN INSIGHTS BY SPACE
Key Insights
LABOUR RELATIVE AREA
LABOUR EQUIPMENT
COMPANION SUPPORT
PERSONAL STORAGE
EDUCATIONAL MATERIALS
LABOUR TRACKING
PLANTS

ACTIVITY

Space Programming

Programming is a process used to identify specific spatial requirements and design criteria. A space programme is a list of the rooms and spaces required for a facility to function, which includes area values and key information such as bed numbers.

Look at examples of space programmes for similar facilities

- Conduct a review of existing MoH and international standards to deduce the typical design programme for your facility type. Helpful international standards include the International Health Facility Guidelines (IHFG), which contain standards and guidelines from selected contexts around the world.
- Review the design programme which was produced for the project in Ethiopia and Bangladesh (and included in the "Design Principles" document) as a reference. This programme can be used as a starting point that can be adapted to the specific needs of your context.

For our pilot project, we referenced the Australasian Health Facility Guidelines (AusHFG), which helped to frame standards from moderately-resourced contexts. We also referenced The New Indian Health Facility Guidelines (HFG-India), Liberia Health Infrastructure Standards, and South African Essential Newborn Care Norms and Standards.

Example space programme

Area	Program	Quantity	Notes
Inpatient Maternity			
PATIENT	Labor Ward	**2-6 patient beds** (7m² minimum should be provided for each patient bed) **+ companion seating/benches**	A separate labor ward is strongly recommended (so laboring patients are not mixed into a general female ward, or sharing space with postpartum patients.) Include seating for 1 companion next to each patient bed. If space permits, also include beds or benches for companions to sleep in the labor ward. (see page XX)
	Postpartum Ward	**2-6 patient beds** (7m² minimum should be provided for each patient bed) **+ companion seating/benches**	A separate postpartum ward is strongly recommended (so postpartum patients are not mixed into a general female ward, or sharing space with laboring patients.) Include seating for 1 companion next to each patient bed. If space permits, also include beds or benches for companions to sleep in the labor ward. (see page XX)
	Delivery Room	**1-2 delivery beds** (18m² minimum should be provided for each delivery bed) **+ newborn resuscitation**	In addition to delivery beds, include space for alternative labor support equipment to provide mothers with a choice of birth positions. Newborn resuscitation areas should be provided within the delivery room.
	Patient WC	**2-6 toilets** **2-4 showers**	Patient toilets and showers should be directly accessible from labor and postpartum wards, as well as the delivery room. At least one toilet/shower should be handicap accessible. Prioritize high commode toilets.
STAFF	Nurse Station	**1 nurse station**	1 centralized nurse station dedicated to maternity services should be sufficient for a health center. However, depending on the unit layout and size, a small nurse outpost/ desk could also be embedded into the labor ward.
	Duty/On-Call Room	**1-2 beds**	Duty rooms (also called on-call or overnight duty rooms) allow providers to rest in close proximity to patients while they are on call or due to be.
	Staff Lounge	**1 staff lounge**	Space should be provided for providers to change clothing and also take breaks. A staff lounge may include a table and kitchenette; and be either designated to maternity providers or shared with other services.
	Staff WC	**1-2 toilets** **0-1 showers**	Space should be provided for providers to change clothing and also take breaks. A staff lounge may include a table and kitchenette; and be either designated to maternity providers or shared with other services.

Identify spaces that should be included

- These should include existing or typical programme areas, as well as spaces that may not be consistently included in MoH and international standards, such as labour walking areas, family support or waiting areas, maternity waiting homes, Kangaroo Mother Care, cooking and laundry, and spaces for cultural and religious practices.

Confirm care needs that will affect the sizing of spaces

- Identify MNH care delivery targets. These may include the anticipated maternity patient volume (number of births) and length of postpartum stay, as well as anticipated small and sick newborn cases and length of NICU stay, which will determine required bed numbers. Make sure to consider both current and future needs, as well as the impact of incoming and outgoing referrals.
- Confirm what spaces or services should be dedicated for MNH versus shared with the broader facility. For example, will there be a c-section operating room specifically designated for the maternity unit, or will there be a shared operating room serving both general surgery needs and c-sections?
- Determine the ideal inpatient bed distribution. Will there be dedicated labour and postpartum beds in separate spaces, or will they be mixed into a general female inpatient area?
- What number of beds should be in each ward? (Fewer beds per ward is better for patient privacy and experience, but may require more provider oversight.)
- Consider patient acuity and whether there should be separate spaces for sick patients.
- Should there be any private or semi-private rooms featuring 1 or 2 beds? Sometimes these are needed for patients who may need to be isolated or are willing to pay extra for private accommodations.
- Identify what accommodations should be made for companions. Is it possible to provide beds in the wards for companions? Or will they need to sleep in chairs or elsewhere?
- Determine staff space needs. How many nurse stations should there be? Should they be centrally located (in a corridor) or embedded within wards for patient oversight? How many people should they accommodate? Will physicians require separate areas to work out of? What duty/overnight rooms or staff break areas are required?
- Determine necessary support spaces. These may include clean and dirty areas like autoclave, sterilization, sluice, storage rooms, janitor closets, or electrical rooms.
- Identify the number and type of toilets and showers to support both patient and staff needs. Make sure to consider whether wheelchair-accessible WCs are needed, and how to accommodate gender preferences.

The space ratios included in the "Design Principles" document may provide a helpful reference for determining the number of patient beds and WCs required.

ACTIVITY

Space Adjacencies

After a space programme is created, the next step is to develop options for spatial configurations that align with care needs.

Description

This prototyping activity that will not yield a finished floorplan, but rather some possible options for ways that spaces could be conceptually laid out. Designing facility improvements can be a daunting task, as you will be trying to address the needs of myriad stakeholders within inherent constraints. The aim is to quickly generate a range of possible layouts, evaluate their strengths and weaknesses, and evaluate design tradeoffs. Some of the ideas generated will emerge as stronger candidates for further iteration and development.

This process can be used early on to establish an ideal layout for the desired spaces; as a way to determine whether renovation, expansion, or new construction may be the best way forward; or after the building strategy is confirmed, to generate ideas for how best to fit the desired spaces within the parameters of the building or site.

Preparation

1. Designers should produce a set of diagrammatic plans (or 'programme blocks') for each required programme space in the intervention (e.g., antenatal care room or a labour ward) at the same scale as a building or site drawing. Color might also be a helpful tool to differentiate between the facility programme.
2. Reference the Design Insights by Space section of the "Design Principles" document to get a preliminary idea of typical room dimensions and furniture, fixtures and equipment.
3. The team should then print and cut out these programme chunks so they can be physically moved around and stuck to the paper.

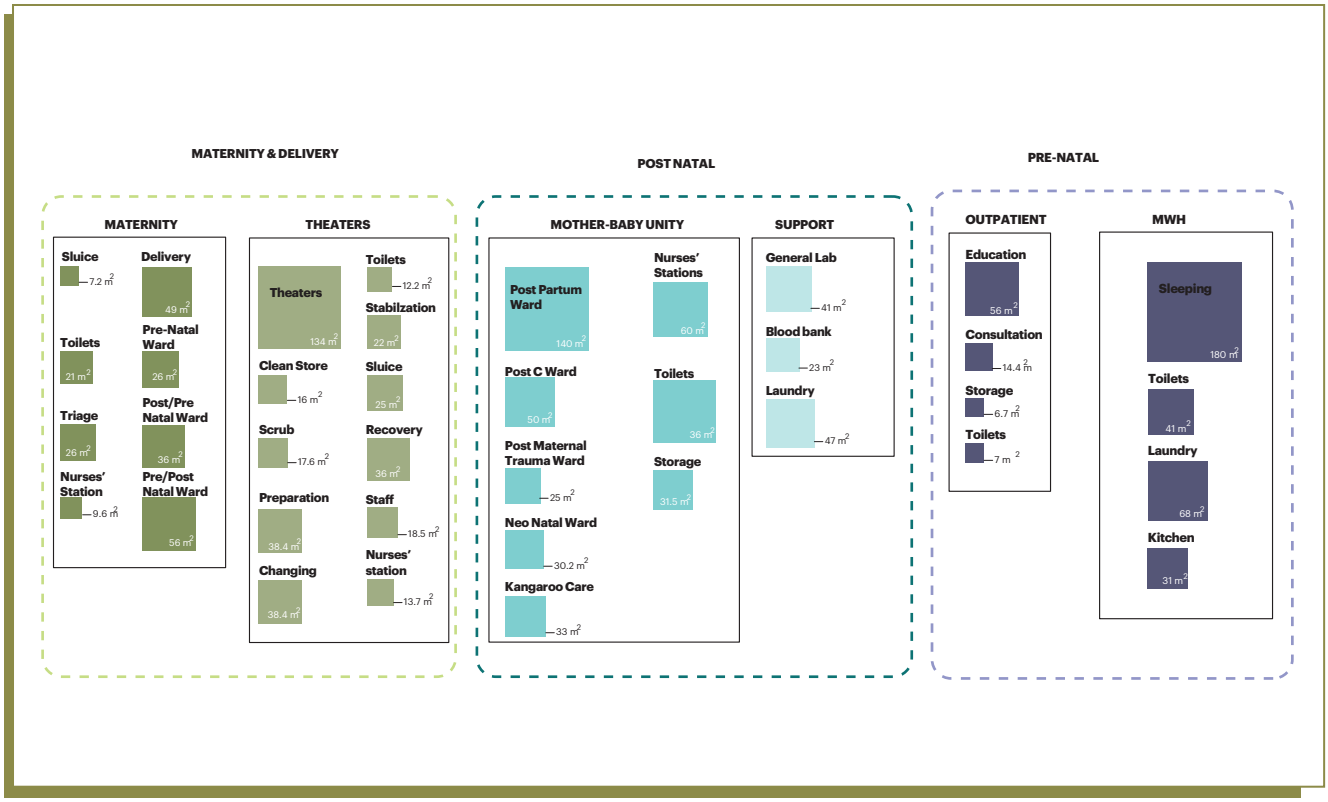
Tips

This activity is most effective when conducted in a group so each team member can share their unique ideas and approaches, which ultimately produces more variety. Team members also help to refine ideas through discussion.

How to do the activity

1. Explore different approaches to arranging the programme blocks to facilitate improved adjacencies and care flows.
2. Identify major, as well as minor, entrances/exits. For example, in addition to a "front" door into the MNH area, should there also be "side" or "back" doors for emergency ambulance transfers or for staff access?
3. Consider programmes that need to be clustered together located near to one another. For example, a labour ward should be proximate to the delivery room, and provider spaces like nurse stations should be located centrally for easy access to patients.
4. Also consider how the placement of these spaces will affect user experiences. Some programmes require a greater degree of privacy than others. For example, a delivery room should be a more private space than a maternity waiting home or an antenatal care room.
5. Make sure to account for patient acuity by placing patients with greater care needs in closer proximity to nurse stations.

Example Space Adjacencies exercise

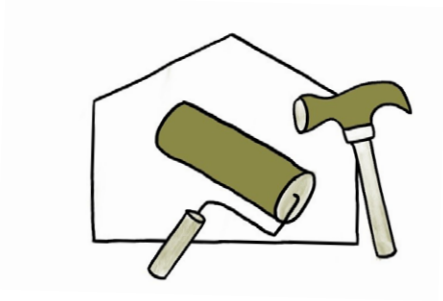


4.1 Informing a Design Response

There are four categories of building intervention: renovation, expansion, upgrading, and new construction. As you begin the design process, it's important that the project team be in consensus about which strategy best meets the need of the facility.

Existing conditions and resources, as well as anticipated services and needs, inform the development of the most appropriate type of intervention. In addition, budgets must be established early on to ensure that adequate funds are available not only for construction, but furnishings and equipment, and staffing and operation.

Renovation



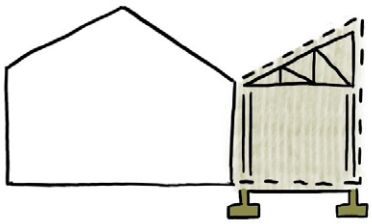
As buildings and infrastructure age or undergo wear and tear from normal use, renovations will be necessary to restore existing structures or make improvements or alterations reflecting the facility's service needs. By definition, renovations entail work that is performed to materially extend the useful life of a building or increase its performance. Three levels of renovation are defined as follows:

- Minor renovations: Include repairs or improvements to building finishes or nonstructural elements. No fundamental alterations are made to walls, floors, ceilings, or the physical layout of rooms.
- Moderate renovations: Include work performed to modify non-structural components such as walls, doors/windows, and fixtures. The physical layout of rooms may be altered within the existing footprint of the building.
- Major renovations: Include work that alters or improves structural building elements such as walls, ceilings, or floors. Changes may be made to electrical, mechanical, and/or plumbing systems. Work should be planned to minimize disruption to care provision.

Consider renovation when:

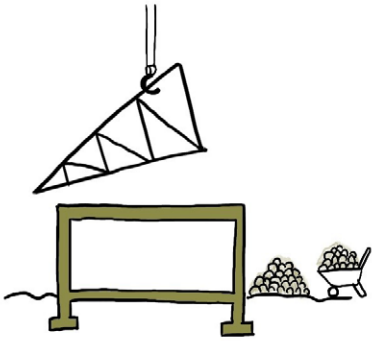
- Enough space can be made available to meet care needs in a location that supports logical care flows at the facility scale.
- Existing buildings are structurally sound and in good condition.
- Existing spaces can be renovated to support safe, efficient, and dignified care.

Expansion



Unlike major renovations, expansions add to the existing building footprint and typically involve extending spaces or adding new rooms to accommodate an increase in users or services. Expansions can be horizontal (extending the building footprint on the site) or vertical (building additional floors if the foundation allows).

New Construction

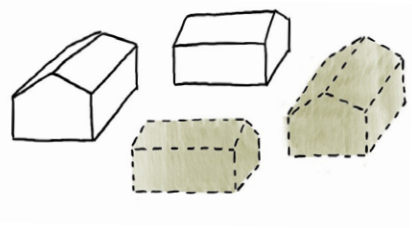


When renovating and expanding existing health facilities isn't possible, new buildings must be planned and strategically located to enable the expansion or improvement of health services. While new construction may require more budget upfront, it can also be a chance to invest in spaces that fully meet long-term user needs; ensure a high quality of care; and optimize safety, dignity, and respect. Keep in mind that a staffing and equipment plan should be created before any new facility can undergo design and construction to ensure that buildings are operational upon completion.

Consider expansion or new construction when:

- There is an increase in the catchment population or patient load, and the facility needs more space to accommodate users.
- The original space was never large enough or located in way that supported effective care flows at the facility scale.
- The original space was not designed in a way that can be renovated to support safe, efficient, or dignified care.
- Additional or improved services are added, requiring specialized equipment and/or spatial requirements.

Upgrading



Upgrading takes place when additional medical services are introduced and qualify the facility to upgrade its designation within the health care system. For example, when a health centre is upgraded to a primary hospital. Upgrades must be done in conformity with the norms and standards specific to each facility.

ACTIVITY

Decision-making

By now, you should have a good understanding of the needs and opportunities for design. This decision-making outline is intended to provide additional clarity on the intervention approach that will be the best path forward.

From our experience in Ethiopia and Bangladesh, these questions were helpful in determining whether to prioritise renovation of existing facilities or new construction. We ended up prioritising renovation in order to leverage existing capital investments from the MoH and other stakeholders. However, in some cases, renovation was not possible. At one facility, there was not enough space to accommodate current patient volumes; at another, there was a need for a more purpose-built maternity building.

Will this site be a good long-term investment?

- Is the site located well in relationship to the catchment area and other referral facilities?
- Is the site prone to flooding or other climate-related disasters? If it is not possible to solve these challenges (e.g., with stormwater management) or such interventions would not be possible from a cost perspective, long-term investments in that site may not be prudent.

Will more space be required to provide quality care, given the patient volume and services offered?

- It's important to aim for an area that will support the number of women served now and in the future, and also make sure it will allow them to stay for the recommended postpartum period.
- If more space is required, consider expansion or new construction.

Is there a need to add programs or spaces that do not currently exist?

- The location of these new programs or spaces should be close enough to existing spaces to ensure safe continuity of care. (For example, the placement of a new NICU near an existing MNH space, or an operating room to a labour ward).
- Also consider whether there is a potential need to upgrade the facility to the next care tier e.g., A health centre with plans to be upgraded into a primary hospital).

Is renovation of the existing building possible and prudent?

- If considering renovation, is the existing building structurally sound?
- Are there plans to move services out of older buildings or to consolidate programs? If so, the team must clearly identify which spaces are possible options for relocating MNH services.

Does the current layout of the building have the potential to support safe and quality care?

- The building layout should permit spaces to be "untangled" and placed more logically and sequentially.
- The building layout should also allow for appropriate ventilation and air flow. Crowded, unventilated interior hallways present a risk for disease transmission and should be avoided as much as possible if the climate permits.
- If it is not possible to renovate the existing building to support safe and quality care, consider new construction.

Is there space for expansion or new construction on the site?

- Do facility administrators or the MoH have longer-term plans for site development that would influence where a new building could go and its size?
- If additional space is not available on-site, you may be restricted to short-term interventions that will only satisfy some of the needs and opportunities identified.

What support from the MoH or funders is there for improvements?

- Larger, more long-term investments will require both will and financial support from MoH and funders.
- Do you have a sense of what scale of budget is available? On what timeframe?
- If funding and buy-in for long-term investments doesn't yet exist, you may need to support additional advocacy, or resort to more short-term solutions.

How will services in the existing facility be disrupted or affected by construction?

- Would a new build or renovation be less disruptive to current MNH services?
- What phasing considerations are there?

4.4 Key Milestones

While the purpose of this guide is to steer you through the process of designing an improved maternal-newborn health facility, we've called out a few key milestones that deserve special attention.

These milestones will be critical to the success of the project and will require you to get feedback from the MoH, facility administrators, and advisors to make sure that the design is aligned with both needs and opportunities and set up for long-term impact.

Planning & Engagement

In Planning and Engagement, you'll lay the foundation for a collaborative, human-centred design process.

- Assemble the team. Determine the role of MoH and how you will engage them.
- Create awareness about the goals of the project and confirm site selection.
- Adapt the Engagement and Assessment Tools to your needs and obtain the necessary Institutional Review Board (IRB) approvals.
- Plan the facility visit and arrange engagement logistics.
- Obtain, or produce, a comprehensive site survey noting topography and the location of existing buildings and infrastructure.

Analysis & Programming

In Analysis and Programming, you'll consolidate the information needed to begin design – including the size, qualities, and arrangement of spaces.

- Put together an "Engagement Report" and "Design Principles" and present findings to project advisors.
- Confirm care needs that will affect space sizing and develop an initial space program with feedback from facility administrators or providers.
- Identify possible locations for the intervention, with feedback from facility administrators and the MoH. Make sure to also clarify any building or site areas that are off-limits, as well as long-term plans for the facility that should be taken into account.
- Determine whether the intervention will likely be a renovation, expansion, or new build, with feedback from facility administrators and the MoH. If space can't be freed up in existing buildings, or the available area won't allow for MNH programs to be consolidated, consider an expansion or new build.

Concept Design

In Concept Design, you'll test ways to achieve the desired improvements within available spaces and confirm a design direction for continued development. During this stage, a project team might explore departmental layouts, identifying displaced programs, and may produce diagrams representing the intended modification and improvement.

- Present initial concept design options to the MoH and facility administrators.
    - When presenting these options, you may need to include an analysis of pros/cons, differences in space programs, and ripple effects on other parts of the facility.
    - It's important to document feedback received, but also to reach a high-level consensus on the direction forward.
- Develop a single, updated concept design based on feedback and present back to project stakeholders.

See the 'Design Case Studies' document for examples

Schematic Design

In Schematic Design (RIBA Stage 2), you will continue resolving the layout and design and develop preliminary engineering approaches. The schematic design synthesizes the design approach while exploring materiality concepts and developing schematic plans, sections, and elevations. At this stage, the project team may want to develop zoning diagrams representing site setbacks, height restrictions, and maximum coverage to get a clearer idea of site constraints.

- Finalize requirements for any site investigations such as topographic surveys, ground investigations, and utilities analysis and procure local consultants to complete the required investigations.
- Develop schematic design, incorporating advisor feedback.
- Get an initial costing done.
    - This initial costing will be based on rough cost-per-square-metre for regional construction figures. More detailed costing will need to be done at the end of Design Development, but this initial costing should provide a baseline range for implementation.
    - Any adjustments regarding phasing or reduced scope need to be decided upon at this stage.
- Present a schematic plan and costing information to the regional health authority, implementing partners, and funders.

Design Development

In Design Development (RIBA Stage 3), you'll integrate additional technical details and engineering analysis to bring the proposed schematic design closer to a finalized project. This phase will include the development of building site plans, floor plans, material selections, and draft details and schedules. Design Development also includes coordination of drawings and documents across disciplines to ready the project for the next phase. A design development drawing set should also include key draft construction details and enlarged plans showing proposed furniture and interior layouts, as well as draft versions of plans, sections, elevations, and details from each engineering discipline.

- Develop a draft Bill of Quantities (BoQ) for project costing review.
- If the project intends to renovate existing buildings, a site visit might be necessary to confirm on-site conditions such as lighting and existing infrastructure.
- Coordinate between various design disciplines including architecture, electrical, plumbing, structural, mechanical, civil, environmental, and other involved professional teams.
- Begin conversations with local planning and approval entities to prepare for submissions after the following design stage.

Construction Documents

In Construction Documentation (RIBA Stage 4), you'll turn the design into the final set of documents either to be bid out or handed over to a pre-selected building contractor. A project team will typically create a comprehensive tender document package including full sets of drawings, as well as a tender BoQ for costing qualifications. A final set of construction documents will need to be submitted to the local building permit or city council to provide approval for construction. Ideally, this process is handled by the partnering government health body.

- The full set of construction documents will need to include details of any bespoke fabricated elements, schedules for all furniture, doors, windows, and other built-in elements, as well as specifications for procured fixtures and fittings.
- Construction documents need to be produced and shared according to the drawing requirements as outlined by the local professional body of architects and engineers. If unavailable, refer to drawing standards provided by RIBA (Royal Institute of British Architects) or AIA (American Institute of Architects).
- Be prepared to advocate and push for design propositions that may not be well understood by the contractor or other implementing partners but which are key to providing a healthier, safer built environment for mothers, newborns, and providers.

Throughout this process, make sure to plan not just for the capital costs of construction, but also the budget requirements for commissioning, staffing, and operation of the new facility.

Furniture & Equipment

Furniture and equipment selection is not a distinct design phase, but should be carefully planned in parallel with the building design process. Medical equipment, in particular, should be thoughtfully specified in response to the services offered and care delivery context. Select types of equipment that providers will befamiliar with how to use and will be able to be maintained or repaired locally. Procurement can be a lengthy process, so make sure to time it such that furniture and equipment are ready to install when the building is complete.

PHASE 5

Implementation

What

Implementation involves translating a design into a built outcome. For a space redesign project, implementation might mean renovation of an existing building, new construction on an existing site, or the construction of an entirely new health care facility.

This phase should also include evaluation. The reason why human-centred design processes are always represented as circular is that there is never a clear finish line to implementation. At the 'end' of a project, the team should reflect on learnings, develop adapted approaches, and share knowledge with others. These steps are necessary for replicating and scaling impact.

Who

The design and engineering teams will assist the MoH or implementing partner with selecting a local contractor and overseeing the construction process. A broader group of project stakeholders may be involved in the evaluation and dissemination process.

Outcomes

The outcome of this process will be a completed built space that is ready to use. After the new space is opened, the project team should reflect on the human-centred design process, reflect on learnings, evaluate the impact of the improved spaces on user experiences and outcomes, and disseminate findings.

Construction

- Plan construction in a way that minimizes disruption to existing care services on-site.
- Consider opportunities to involve local community members in construction. This can create job and training opportunities, contribute to the local economy, as well as build buy-in and awareness about health services.
- Employing women as part of the construction team – from site supervision roles to skilled or unskilled labour – can also be an important opportunity to strengthen messaging about the role of women in society.

Opening

- Prior to opening, it's important to walk facility staff and providers through the space to explain why the spaces were designed the way they were and how that may lead to improved outcomes and experiences.
- Answer questions they may have about the space layout or design features and communicate any information critical to successful building use and maintenance (for example, closing or opening windows for ventilation).

Impact evaluation

- After the building is in use, carry out an impact evaluation to assess whether the design is having the desired effect on care experiences.
- There is little academic research that documents the impact of space design on maternal-newborn care, so if you have the resources to conduct a rigorous, peer-reviewed study, please do so!
    - Consider comparing the “before” and “after” states of the facility, or comparing the improved design to other similar facilities in the region. The following study may provide a useful reference: “Built spaces and features associated with user satisfaction in maternity waiting homes in Malawi.” (Midwifery 62 (2018) 96–103).
- If a rigorous academic study is not possible, even a “light” impact evaluation based on anecdotes and feedback from a small group of participants will be informative and useful.

Lessons Learned

- As a project team, come together to identify lessons learned. What went well that you would advise others to do? What challenges came up in the project that you would approach differently next time? What additional support, feedback, or collaboration would have helped the project go more smoothly?
- Also make sure to spend time in the facility to observe if the spaces are being used as intended. What do patients, companions, and staff think of the design? Are care flows working the way you anticipated? Are there any specific needs that were overlooked in the design? Are there any positive effects on user experience or behavior that you didn't expect?

Sharing and Dissemination

- Invite MoH representatives, other facilities administrators, and funders to visit the facility and see the improvements you have made first-hand. It can be difficult to abstractly imagine the impact that space design can have on the experience and quality of care, but seeing the manifested designs in action could anchor the importance of scaling these learnings.
- Consider documenting the improved space using video or photographs. This will allow a much broader range of stakeholders to see and learn from your work.
    - Consider including anecdotes or testimonials from patients, companions, or staff that explain how the improved space is affecting the care outcomes and experiences.
    - If your budget allows, you could even consider an immersive 360° virtual reality video using software like Matterport. See the PATH Neolens project as a reference.
- Find opportunities to share the design process, outcomes, and lessons learned at national and international convenings. This is a chance to not only champion your work, but be an advocate for human-centred design and maternal-newborn health.