

Lab.our Ward

Re-thinking the
birth experience

The **Lab.our Ward Innovation Project brings together expertise from the fields of product, service and architectural design, in collaboration with maternal health experts, to improve the birth experience in low-resource settings.**

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How can one actively support and embrace a woman's individual process of birth?



EXECUTIVE SUMMARY

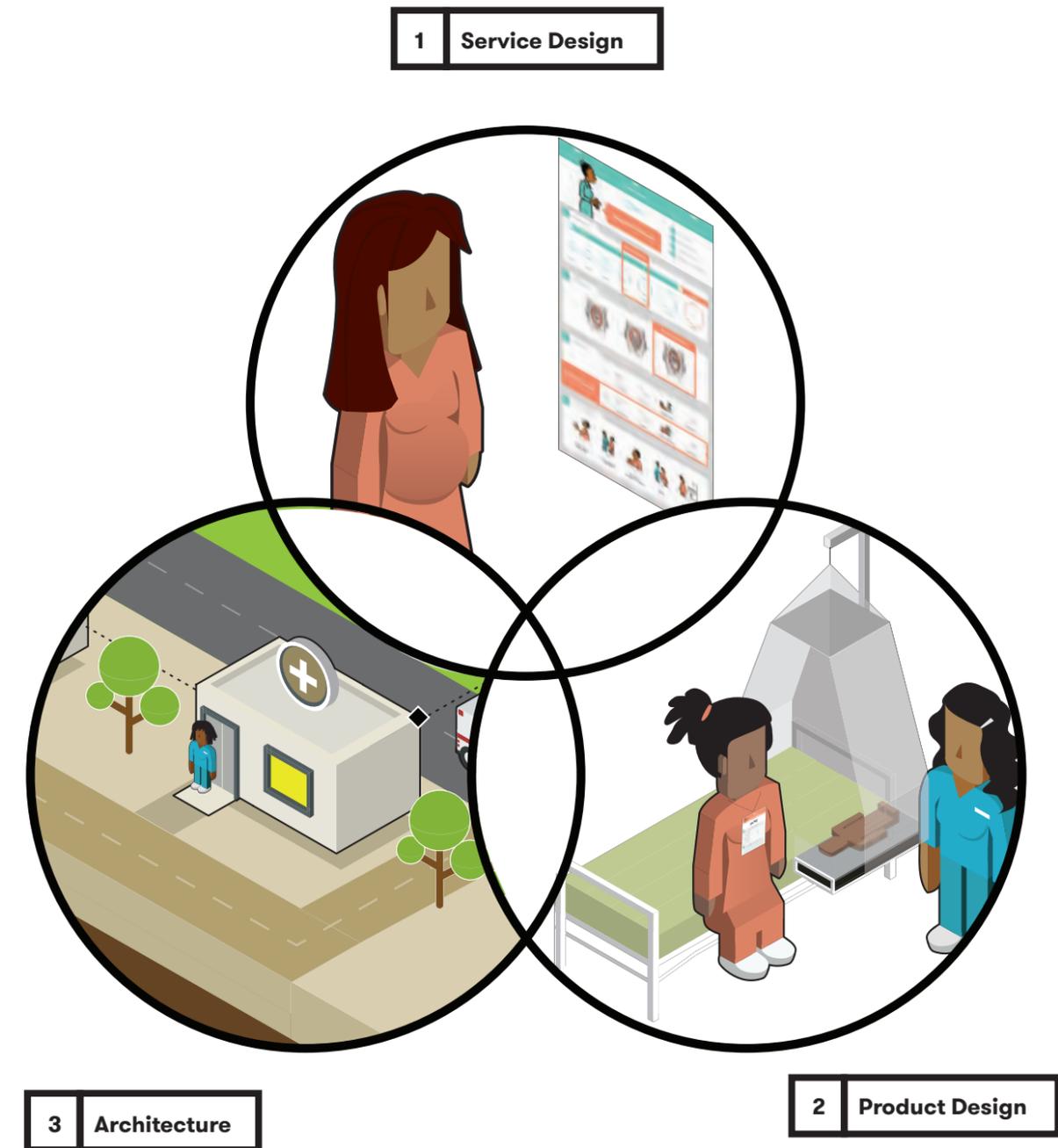
The Lab.our Ward Innovation Project brings together expertise from the fields of product, service and architectural design, in collaboration with maternal and newborn health experts, to improve the birth experience in low-resource settings. Through innovations and tools applied to new and existing health facilities, the Lab.our Ward project aims to improve quality of care from the perspectives of both women and care providers. Ultimately, the Lab.our Ward innovation project seeks to have a positive impact on health outcomes for mothers and newborns worldwide.

The project led by M4ID has been developed through a collaborative process, bringing together partners at global and national levels. By employing a Human Centred Design approach, the project has rethought the birth experience through service, product and space innovations tailored for maternity wards in resource constrained settings.

In doing so, the Lab.our Ward has focused on the woman's journey of care and has sought to improve health outcomes by practical application of and alignment to WHO's Quality of Care framework. The design proposals and concepts, presented in summarized form here, are thus rooted in clinical evidence, combined with user insights gathered through field research in India, Kenya, Uganda and Nigeria.

The Lab.our Ward model, which continues to be built on, presents solutions aligned to the Arrival, Admission, Labour, Delivery and Postpartum stages in the care journey. Service design outcomes include a set of recommendations and tools to improve provider-patient communication, understanding of the delivery process, as well as safety. Product and architecture concepts are focused on supporting the provision of women-centred quality of care, improving comfort, cleanliness, privacy and sustainability with solutions fitting for their context. The innovations and tools can be applied to both new and existing health facilities.

By focusing on a woman's holistic experience of childbirth, supporting facilities to find solutions most fitting for their needs and by forging collaborative partnerships, we seek to make a safe and dignified childbirth experience a reality for all.



BACKGROUND

“No one has a full overview on what is going on. We just see the bits and pieces and therefore sometimes its challenging to prioritize right.”

(Midwife, Kenya)

While maternal and infant mortality rates have dropped significantly in the last twenty years, complications during pregnancy and childbirth claim the lives of thousands of mothers and newborns each year. Every two minutes, a woman dies from causes related to pregnancy or childbirth, and each year more than one million children die on the day they are born.

The growing demand and utilisation of health services often means that a higher proportion of avoidable maternal and perinatal mortality and morbidity occurs in health facilities. In this context, poor quality

of care (QoC) in many facilities becomes a paramount roadblock in the quest to end preventable mortality and morbidity. (Tuncalp et al, 2015)

Overcrowding, poor infection prevention and control and the lack of essential health infrastructure mean that for many women, the experience of birth is neither safe nor comfortable.

As the number of births taking place in health facilities around the world continues to rise, maternity wards must be adequately prepared to deliver high quality

care to women and newborns everywhere.

A woman's physical surroundings during childbirth can affect her perception of how easy or difficult it is to give birth.

Focusing on a woman's holistic experience of childbirth, including the infrastructure, products and services available to her at health facilities, has the potential to improve maternal and newborn health outcomes. The Lab.our ward project looks at both existing and new ways to deliver improved quality of care based on evidence and inspired through a human centered design process.



UNICEF estimates that globally an average of 353,000 babies are born each day. – equating to 255 births per minute or 4.3 births every second.

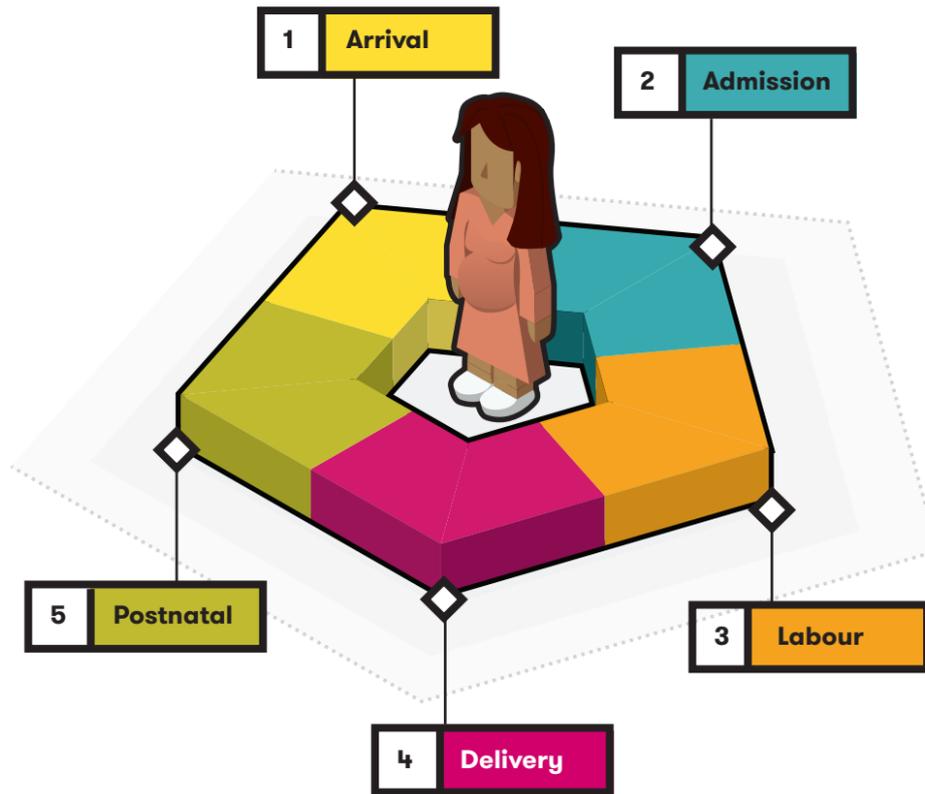
WHAT IS LAB.OUR WARD?

Lab.our Ward is a new approach to the design of the maternity ward space, its services and user experience. Quality of care is improved from the woman's perspective, which may positively impact maternal and newborn health outcomes in low resource settings.

The Lab.our Ward project addresses quality of care from three pillars – services, products and space – and uses the woman's journey through the facility (from her arrival to discharge) as the central concept to facilitate a safe and dignified childbirth experience beyond just statistics and survival.

Because spatial aspects such as lighting and useable space as well as the availability and efficacy of care products, electricity supply and commodities directly influence care provision, Lab.our Ward is a holistic approach for quality of care improvement considering this complex interplay between service, product and space.

To end preventable maternal and newborn morbidity and mortality, every pregnant woman and newborn needs



- | | |
|--|--|
| 1. Actionable Information Systems | 5. Respect & Dignity |
| 2. Functional Referral Systems | 6. Evidence based practices |
| 3. Effective Communication | 7. Essential physical resources |
| 4. Competent & Motivated HR | 8. Emotional Support |

skilled care at birth with **evidence-based practices delivered in a humane, supportive and respectful environment** (Tuncalp et al, 2015).

Tuncalp et al (2015) emphasize that good quality of care requires appropriate use of effective clinical and non-clinical interventions, strengthened health infrastructure and optimum skills and attitude of health providers, resulting in improved health outcomes and positive experience of women and providers.

The Lab.our ward project therefore aligns its designs and concepts with evidence based practices and applies the WHO Quality of Care Framework to the design of the architectural, product and service solutions. Each of the solutions and recommendations developed reflect at least one of the eight domains of the framework.

“In order to accelerate reductions in maternal and perinatal mortality and severe morbidity we need to go beyond maximizing coverage of essential interventions.”

(Tuncalp et al, 2015)



Photograph by Damaris Rodriguez

SERVICE DESIGN

The Lab.our Ward project uses a service design approach to re-design the maternity ward. Service design is multidisciplinary and participatory approach to design services that are useful, usable and desirable from the user perspective; and efficient, effective and supportive from the provider perspective. Service designers plan services based on the needs and aspirations of users while considering the system and the constraints and requirements, in which a service must operate.

Each service manifests itself as a journey to the user: from the moment of realizing the need for a service, to engaging with a service, through to forming an impression of the experienced service.

Designers use the “service journey” as a tool to identify the ideal user path and to map the key moments of the service experience. These moments, when a user comes in touch (mentally or physically) with a service is called a “touchpoint”.

Touchpoints, such as a reception moment or engaging with an information sign, can actively be designed to drive certain behaviour and evoke a certain experience about the service.



Services as experienced moments are always connected to and influenced by the space in which they are provided as well as by the products that enable or support the service provision.

Using a journey based approach to designing healthcare services, its products and space as well as identifying the key moments in the journey enable smoother, more consistent, and more enjoyable service experiences to emerge.



“As I was in operation no one gave me any information about the progress in delivery.”

(Mother, Rural Ranchi)

WOMAN CENTERED JOURNEY

Women arriving to a facility for childbirth come in contact with health care services. Health care providers have been trained to provide care according to care protocols. However processes of delivering care are also shaped by personalities, culture, context, constraints and other influencing factors.

The Lab.our ward project collaborated with facilities in Kenya, Uganda, Nigeria and India to identify the contextual needs and shaping characteristics that influence service delivery and quality of care.

The design team together with health care providers and women with their male partners mapped the key moments in the woman's journey through childbirth and co-designed solutions to support the journey. Therefore the solutions encompassed by the Lab.our ward model are rooted in real user and provider needs and take into consideration the constraints of low resource setting environments.

The design model used follows the journey of the woman in a facility through 5 key steps; Arrival, Admission, Labour, Delivery and Postnatal.

The model is realized through outlining a set of recommendations as well as minimum and optimum solutions for the provided services, surrounding infrastructure and needed products. These recommendations and various solutions are explained more in detail during the following pages.



ENSURING WOMEN FEEL EXPECTED AND ACCEPTED

- **Tools needed for risk assessment and prioritization**
- **Clear communication of the service, the place and following steps**
- **Provision of a personal welcoming experience for the woman and her companion**
- **Increased staff preparedness**
- **Limiting the number of visitors**



ARRIVAL

ARRIVAL

Ensuring women feel expected and accepted

Pregnant women arriving at the facility can feel fearful, vulnerable and uninformed of the process that awaits them. This uncertainty and emotional stress may grow if care professionals do not meet and welcome women when they arrive at the facility. The arrival process is also important as it provides the first opportunity for visually assessing the client and planning the ensuing care.

The key aspect for service provision at arrival is to **make women feel accepted and expected**. To improve this experience we need to ensure that a woman knows where to go and what to do - as soon as she arrives at the facility. The entrance door of the facility has to be clearly marked and accessible for everyone, including disabled clients. For emergencies the entrance should be different to facilitate direct access to care. This way it is easier to protect client privacy and to keep the general atmosphere calm.

Security personnel have an important role in ensuring safety, but also providing

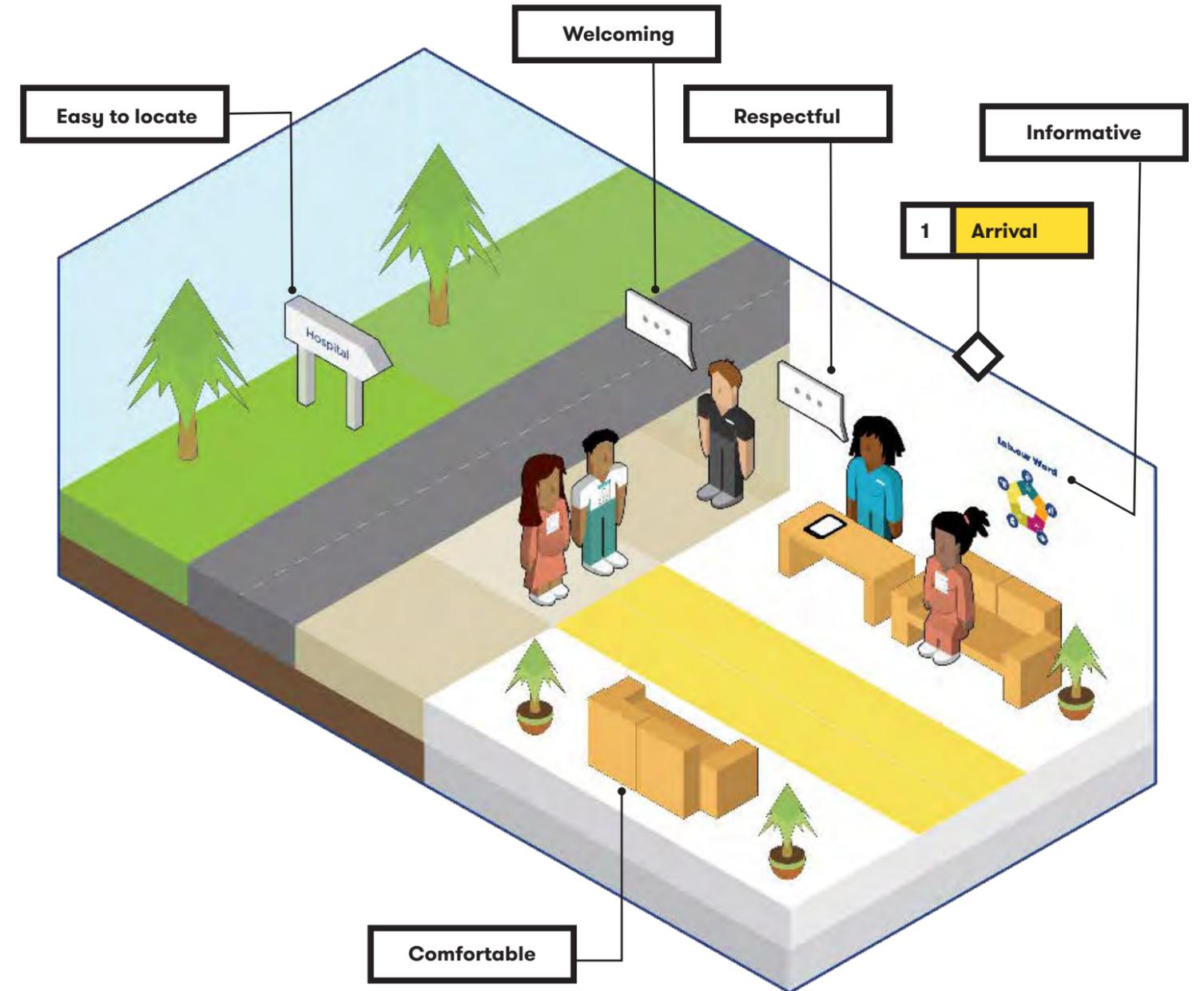
accurate information for clients and visitors. The reception desk is low, allowing the woman and nurse/midwife to meet in an open environment. Next to the desk is a seat, so that the woman can sit down and rest while she is being interviewed and registered. Part of the desk is at the same height as the sofa so the receptionist and the woman can discuss while seated and the communication always happens at eye level.

The assessing care provider or receptionist can use a digital check-in tool to register the woman into the facility. Based on the data collected, the tool adds the woman to a client queue and shows the midwife/nurse a prioritized list of clients. For urgent or emergent cases, the tool aids in decision-making as well as facilitates the referral process.

The woman and her companions can be given a set of wearable passes for better identification. The pass for the woman contains her arrival time, preferences for her birth such as choosing to save the placenta or allowing blood transfusion, as well as

checkups done during her current visit. The pass for companions contains information on how to provide support during the childbirth process and what their roles and expected tasks are during the stay.

The arrival hall is inviting, emulating a warm and welcoming ambience and projecting a sense of calm and safety. There are tables and seats available while waiting one's turn. The colours are selected based on culturally relevant recommendations, which facilitate orientation in the physical space. Informative colours can also be applied to the floor, signs, and smaller surfaces as well as on furniture and textiles. Pictures on the wall illustrate the care services provided, which help the client to better understand the childbirth process and enable her to prepare for next stages.



DECISIONS ARE TIMELY AND WELL COMMUNICATED

- **Warm welcoming** **space and asking for consent on the procedures**
- **Proper collection of data and prompt decision on next steps**
- **Make the woman and the companion feel relaxed during the assessment by offering a private**
- **Clear communication of the outcomes of the assessment and the following steps**
- **Dedicate specific place when admitting to the facility**



ADMISSION

ADMISSION

Decisions are timely taken and well communicated

Admission to the facility is a crucial moment in the journey of childbirth, as the collected information and data is used for prioritization and for evaluating the level of care a client needs. Often in busy facilities, admission is a process that can take place in different locations and through different practices. This can limit client privacy and may create unnecessary stress. It can also be difficult for staff to take time and really focus on the client and answer any questions. Low antenatal care (ANC) adherence and/or missing records are also a big factor affecting the admission, since usually little background data about the woman and her pregnancy is available.

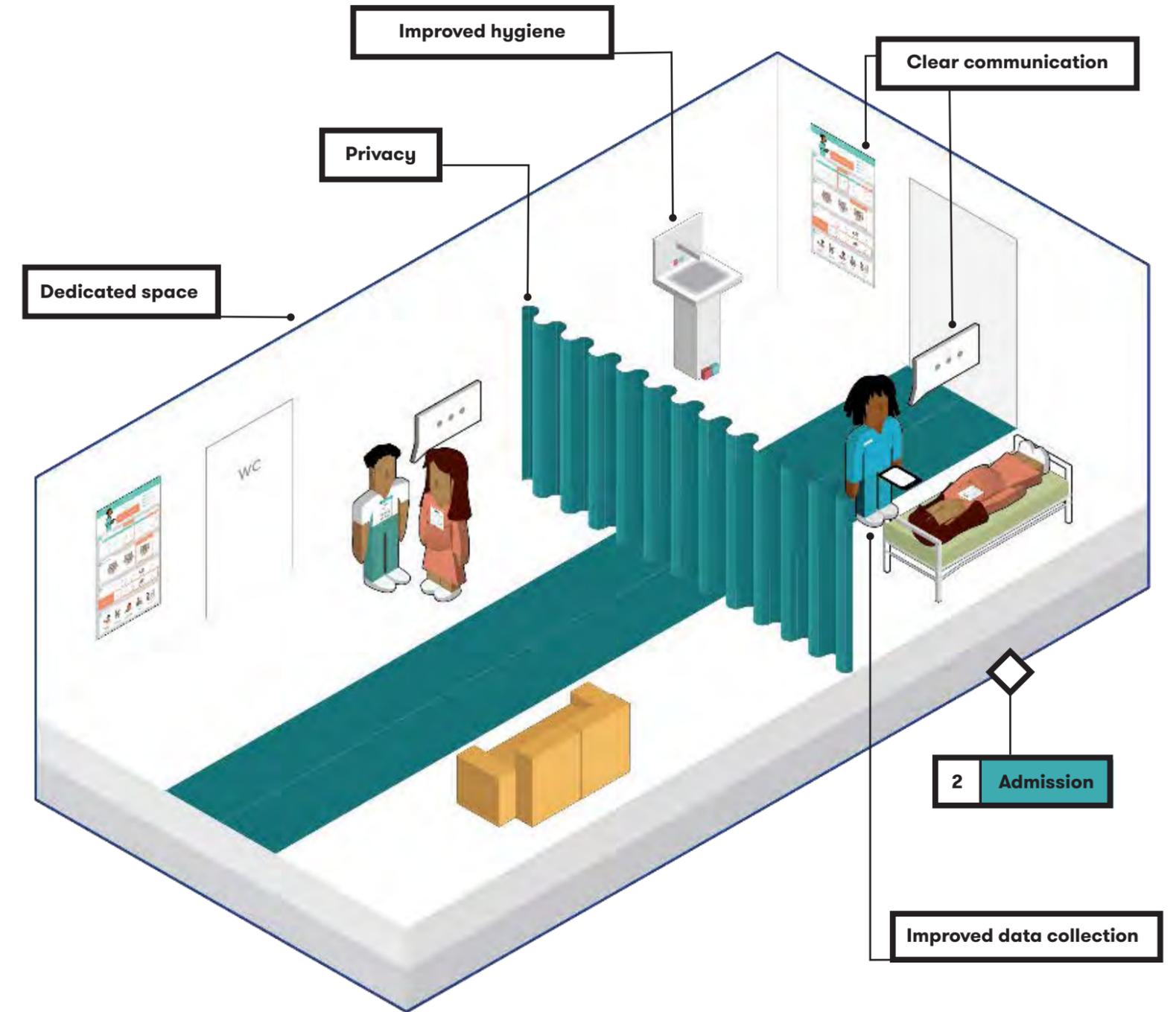
The admission space is a private room, with all the necessary supplies available to perform tasks in an accurate and discreet way. The improved communication and informative materials available help the client have a better understanding and prepare her for the coming assessment.

Communication tools are used to support the discussions between the nurse and the client and her accompanying person. On the walls there are supporting graphics

informing her of the different stages of labour, as well as other general guidance, to make the situation and process easier to understand. A birth board tool (Bold) allows the provider to clearly communicate the stage of labour and current condition, expected next steps in care as well as general guidelines and coping mechanisms to improve wellbeing and reduce pain during the different stages of labour.

In case of emergency, the digital support tool (iDeliver) helps the provider seek assistance and if necessary, initiate a referral. The tool will outline key steps what needs to be done based on protocol and what to take into consideration. It will also advise what to communicate to the woman and is useful in informing the receiving facility of the referral.

The hand washing station and hygiene information is visible to remind staff, clients and companions about hand washing routines. The room also has easy access to a toilet, which can be used for collecting urine samples when needed.



ENABLING EVERY LABOUR TO PROGRESS SAFELY

- **Create a positive, encouraging as well as comfortable and safe environment for active labour**
- **Provide midwives and nurses with the tools to carry out timely monitoring and to communicate clearly with each woman**
- **Inform and support women about how to ease contraction pains and progress through their labour and delivery**
- **Raise awareness of the role the companion can play in supporting and assisting the woman during labour**

03

LABOUR

LABOUR

Enabling every labour to progress safely

It is not uncommon for labour to take place in the arrival area or in an overcrowded corridor. There is often no dedicated, comfortable space for women who are in labour - where they can move through labour and express themselves as they experience labour pains. Also the companion's role as a supporter during labour is seldom taken into account.

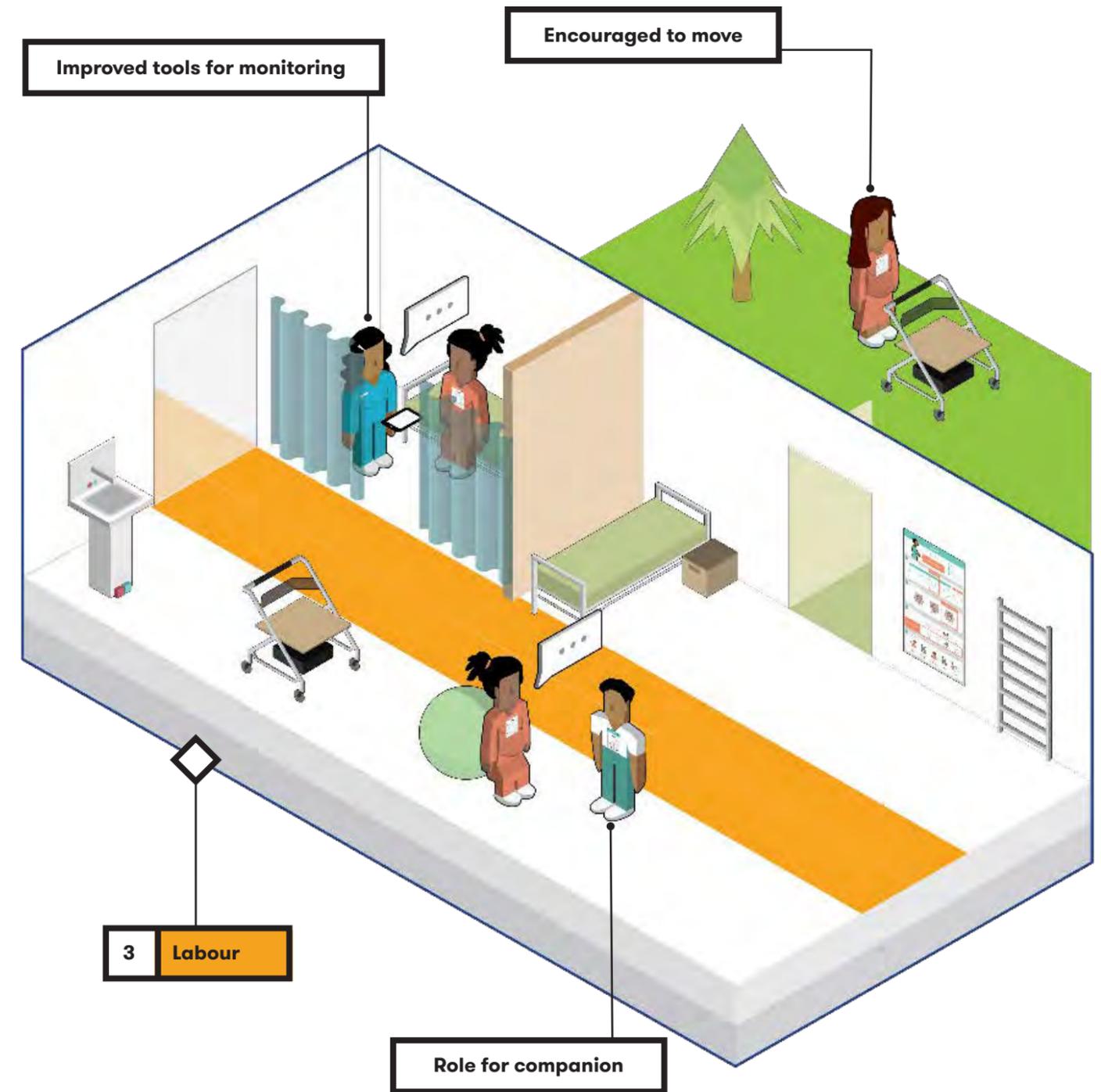
The labour space is designed to encourage movement. Studies conducted by Cochrane Pregnancy and Childbirth Group and Institute of Women's and Children's Health suggests that women in low-risk labour should be walking and in upright positions. Movement may reduce the duration of labour, the need for epidural or other pain related anesthesia, and is not associated with increased intervention or negative effects on maternal or newborn well being. Products which support mobility during labour should be available and if possible the labour space can also have access outdoors to encourage walking in the fresh air. Thus a companion should be always welcomed to support the woman in the labour space.

With guidance the companion can help the

woman with communication, improving her comfort, feeling of support and security. Pictures on the walls of the labour room or other informative tools such as companions pass illustrates different ways how he or she can help her e.g. find more comfortable positions to go through the labour pain. The companion can also help the woman to use various activity products available, such as wall ladders for stretching or gym ball to sit or lean on.

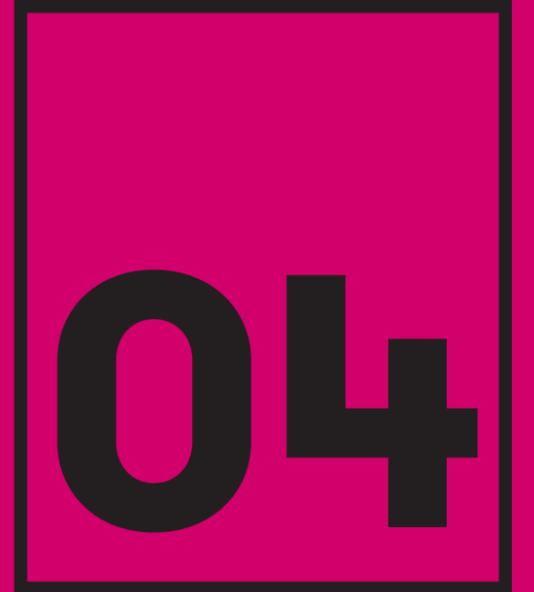
In the labour room there are a few beds with partition walls for women who need more privacy while resting. These spaces may also be used for labour monitoring and routine checkups to ensure client privacy. A storage room contains mattresses for her support person to ensure comfortable rest during the night. Also a toilet and shower is connected to this space.

There is a clear and easy access between the labour and delivery rooms. A personal trolley can be given to the woman to store her belongings. The trolley can also be used while walking around the facility. It also offers support to lean or sit and rest on during labour.



PROVIDING AN AREA THAT SUPPORTS CLIENT MOBILITY AND SAFE DELIVERY

- **Creating privacy for women while ensuring visibility for the healthcare providers**
- **Enable health workers to keep track of each woman's delivery, and document the important moments during the birth process**
- **Involve the companion during the birth**
- **Create an environment which reduces stress levels - both in women, companions and in health workers.**
- **Enable alternative delivery positions**
Ensure appropriate newborn care and immediate skin to skin contact between mother and baby



DELIVERY

DELIVERY

Providing an area that supports client mobility and safe delivery

Although the delivery space is one of the key places in the facility, often there is little or no privacy for women to give birth. The space may also lack clear visibility for healthcare providers or adequate access to emergency care. Women are frequently left alone and documentation is sometimes neglected.

Lab.our Ward designs facilitate both privacy and clinical supervision. The nurse-station is placed centrally between all the delivery rooms. Each delivery room has an angled mirror on the ceiling, which means that the nurses have a view to all rooms from the corridor. At the same time, the view is blocked from people otherwise moving in that space.

Private delivery rooms accommodate the woman from the time that she is 7 cm dilated until two hours after delivery. The private rooms allow the woman to be accompanied by a supporting person. On average, a woman will stay between 4 to 6 hours in the private delivery room. This estimated time is however not to be considered as a strict guideline (and certainly not as a maximum required time) as the actual time needed is based on

the individual needs of women and their newborns.

The room is designed to have enough space to enable the client to move around and interact with the delivery bed. The space allows the companion to support the labouring woman from different sides of the bed and to adjust the bed according to her needs and wishes. The key feature in the new delivery bed is the possibility to try alternative positions during labour and delivery. The bed can be adjusted between lying, sitting, kneeling and squatting positions and the arch enables her to hang on it or to use it while lying on her side. The ability to choose based on her personal wishes helps the client feel more empowered and in control of the situation. It can also reduce delivery-related pain and utilizes the benefit of gravity.

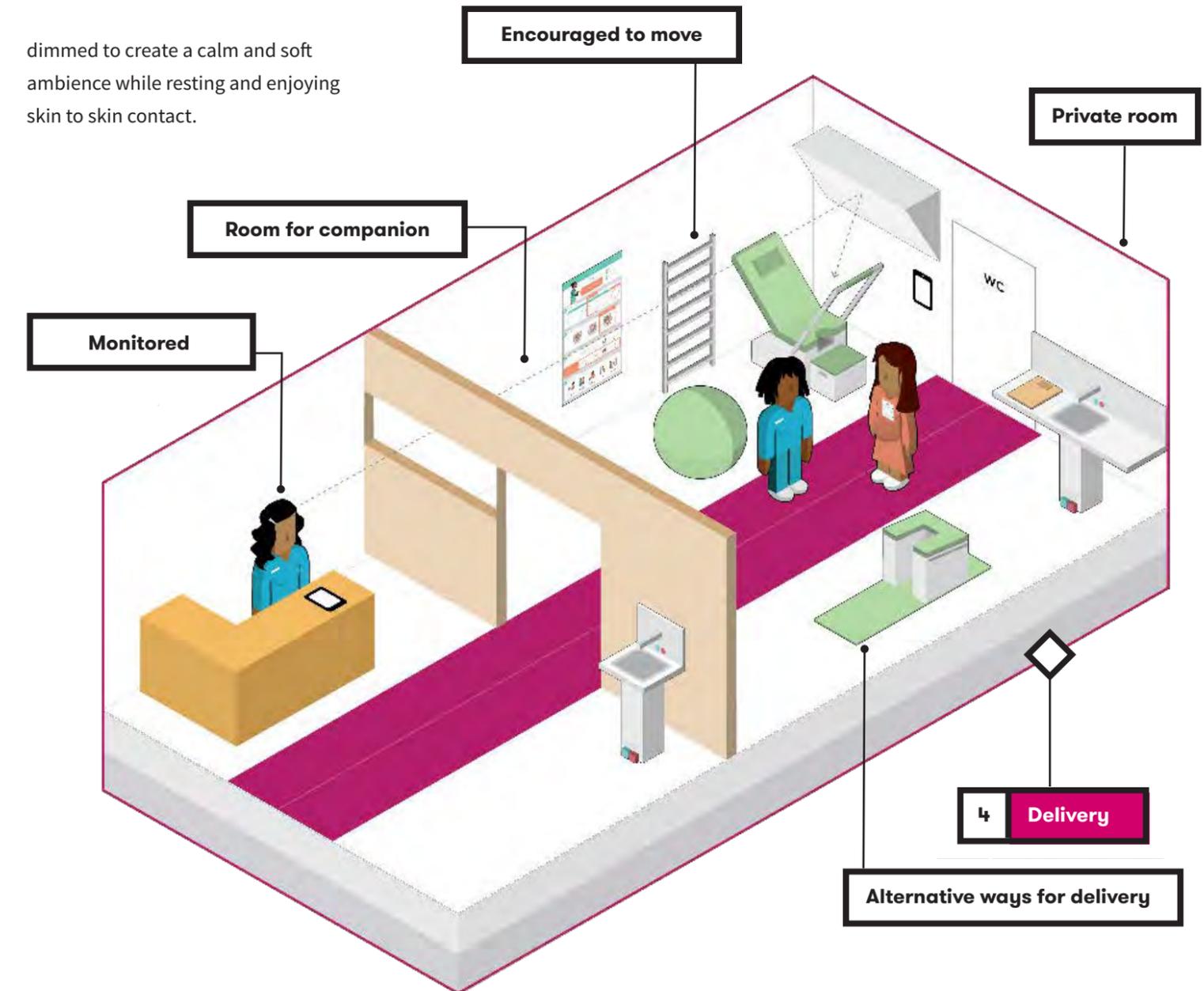
The colour for the delivery room is based on cultural preferences and tones which enhance perseverance, motivation and courage. In the space there are different options for performing the delivery including delivery bed as well as a stool and other props similar to the ones in the labour room space. There is also a private

combined toilet and shower in the space.

The private room will allow the mother and newborn to rest and take time for skin-to-skin contact and initiation of breastfeeding before moving to the postnatal space. Supporting undisturbed skin-to-skin contact immediately after birth has been proven to improve physiologic stability for both mother and the newborn and also has longer-term effects on their attachment and the child's development.

Ideally, mother and newborn could be given at least two hours for recovery and peaceful skin to skin contact with initiation of breastfeeding in the delivery room; this would also allow time for other aspects of clinical care such as vitamin K injection, weighing and measuring of the newborn as well as allowing the mother to shower and freshen up before moving to the postnatal care area. As a reminder of its importance, pictures of skin-to-skin contact are visible in the delivery room

In this space it is possible to adjust the light based on need and personal preference. The light can be dialed up when performing tasks which require better visibility and



dimmed to create a calm and soft ambience while resting and enjoying skin to skin contact.

CONTINUING CARE WHILE GIVING SPACE AND TIME FOR BONDING

- **Support continuous skin-to-skin contact and establish breastfeeding routines.**
- **Reduce risks and facilitate appropriate counselling**
- **Provide comfort and a space to rest while ensuring adequate attention after the delivery**



POSTNATAL

POSTNATAL

Continuing care while giving space and time for bonding

The postnatal area is a place of risk assessment that is often neglected. Patients are sometimes discharged too soon and checks for detecting postpartum hemorrhage and possible other complications may be overlooked. Lack of privacy and peaceful atmosphere also interferes with breastfeeding and bonding with the newborn. Bed-sharing and free flow of visitors also increases the risk of infection.

In many maternity wards in low resource settings, beds are placed against the walls, facing into the centre of the room. This leaves no privacy for clients. New designs must balance the necessity for providers to be able to monitor many women at the same time, while simultaneously providing privacy for women during and after labour.

The suggested solution is a low wall dividing the postnatal ward in two halves and to arrange the beds facing towards the windows (fishbone form). Placing the heads of the beds against a low central wall provides more privacy, yet still enough visibility for providers to have an overview of the ward.

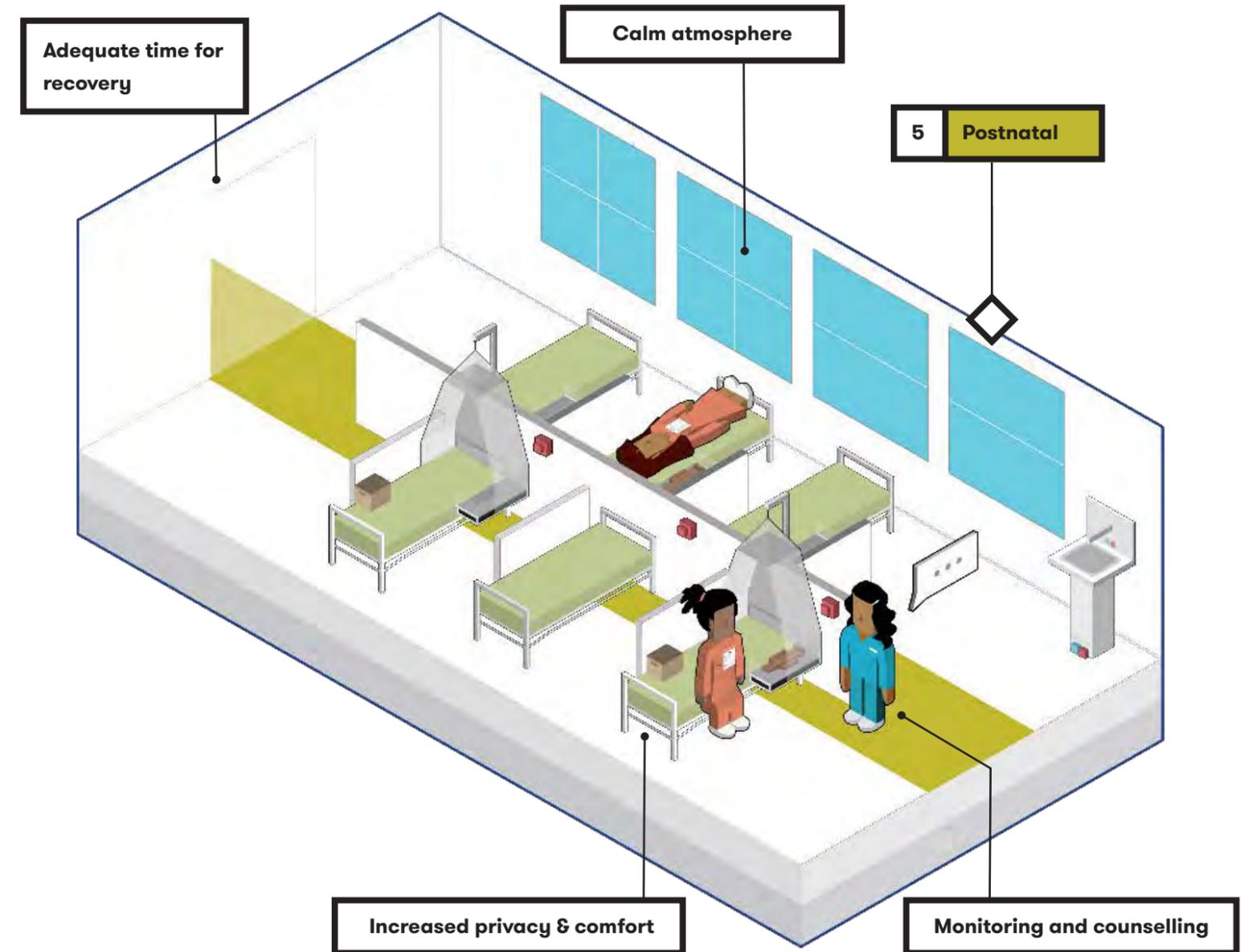
A standing person can see over the wall, while a woman sitting on the bed with her back against the wall is protected. The low dividing walls between each bed allow the women to sit up and talk with their neighbour or to lay down in privacy. When possible, the lower walls are made of natural, local materials, such as wood or woven leaves which adds a warm touch to an otherwise clinical environment.

If necessary, each of the beds and all the windows have mosquito nets to provide protection from diseases spread by mosquitos and other insects. For emergency situations there is a small bell or a call button (depending on the location and possibilities available).

The postnatal space colours will be chosen based on cultural preference to support relaxation and harmony, where the mother and her newborn can bond in a rejuvenating atmosphere. The space is well monitored and during visiting times the number of visitors is limited to keep the space calm. Other public areas of the facility may be used to meet with family members outside of visiting hours.

The architectural plan contains personal recovery rooms for clients whose condition requires more private and secured space. These rooms are suitable for a higher level of care for example in case of infection, pre-eclampsia or recovering after a stillbirth or caesarian delivery.

During the postnatal stay the client and newborn will be monitored through regular checks to detect any potential problems and ensure they are recovering well. Before leaving the facility the parents will participate in a counselling session where the clients feedback is also collected to follow the performance and service quality of the facility. This is done as part of the discharge procedure while the receptionist is also ensuring that all necessary data has been collected.



A woman in a pink checkered dress and a colorful headwrap is walking away from the camera on a dirt path in a rural village. She has a yellow cloth draped over her shoulder. Several children are walking along the path with her. The background features lush greenery, including banana trees, and a simple wooden building on the left. The sky is overcast.

“What do you mean by explanation about the progress through labour - I was just ask to be silent and to keep courage.”

(Mother, Bududa)

SERVICES

Part of the analogue (non-digital) services conceptualized for the Lab.our ward is called “Better Beginnings”, a service for women and their families to access better quality of care at time of childbirth through utilization of a set of tools that accompany the woman through pregnancy and childbirth. Three main tools form the service concept; the “Pregnancy Purse”, the “Birth Board” and the “Family Pass”. The tools have been designed as part of the BOLD project (boldinnovation.org) in close collaboration with the World Health Organization as well as communities and facilities in Uganda and Nigeria.

The **Pregnancy Purse** is a folder containing interactive materials for women and their companions to provide information during pregnancy and prepare them for childbirth. The purse can be placed visibly in the home as a stand or it can be hung on the wall. It has handles to carry it along and the size is designed to fit into a woman’s handbag, which was communicated as an important requirement by the women participating in the design process.

The **Birth Board** is designed as a preparation and communication tool



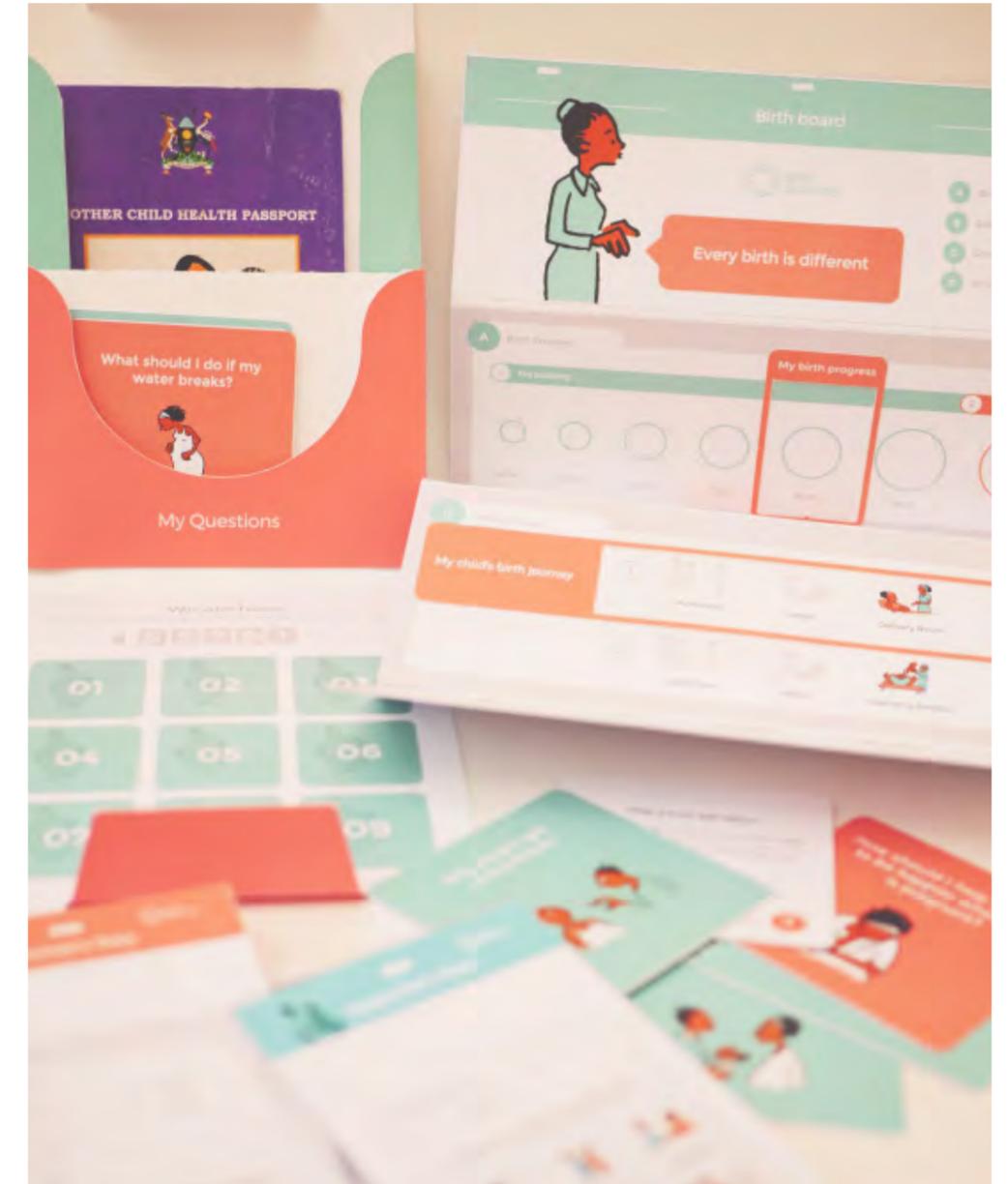
used by nurse or midwife in the counseling session during ANC, as well as during labor and childbirth, to better convey the process of childbirth. It can also be used by the healthcare provider to communicate current or potential conditions that may occur during labor and respective care procedures in a simple, visual and easy to understand form. The tool will support the woman to gain a better understanding of the overall childbirth process and set expectations for quality of care. Used during labor and childbirth, the tool can be used as a communication support

tool for health workers to communicate a pregnant woman’s progress through labor and next steps in her care.

The **Family Pass** is comprised of two wearable passes for the woman and her supporter, and is designed to communicate their preferences and key information during their stay in the health facility. Both the woman and her supporter will wear the pass visibly at all times during their stay in the facility. The pass for the woman contains basic

personal information and her supporters’ contact information, as well as pregnancy-related information including her arrival time, personal preferences and the status of her labor progress. The information on the woman’s pass is designed to provide health providers with a quick overview to assist with decision making and reacting quickly, while taking into consideration the unique needs and preferences of each woman. For the pregnant woman, the pass is meant to be a tool for following her own care journey and encourages her to express her needs. With the help of the visible arrival and admission time, she and her support person can ensure that she is assessed and cared for in a timely manner.

The **Supporter Pass** enables the woman’s partner, family member or friend to be a recognized birth supporter in the facility and offers guidance on how to support and take part in the birth process in a way that improves the woman’s experience. The supporter pass is envisioned to make it easier for the health provider to identify or call him or her when needed. In addition, the pass gives the support person key information on how to support the pregnant woman during the birth process.



Technology enabled services for better communication, decision making and data capture

Technology is a key enabler of modern service delivery systems. Collection and interpretation of data has become one of the most important means to improve service offerings and quality as well as their efficiency and effectiveness. Especially in contexts with high resource constraints, technology based services have the potential to reduce errors while managing workflows and supply services.

There is room for technological interventions and solutions which can be part of maternal care in the near future. Products may already be on the market, however they often lack of a supportive infrastructure or integration with government systems. They might also be unnecessary complicated and thus may entail high product costs.

The Lab.our ward approach contains a set of concepts for new or existing technological solutions to support the woman's journey in the facility.

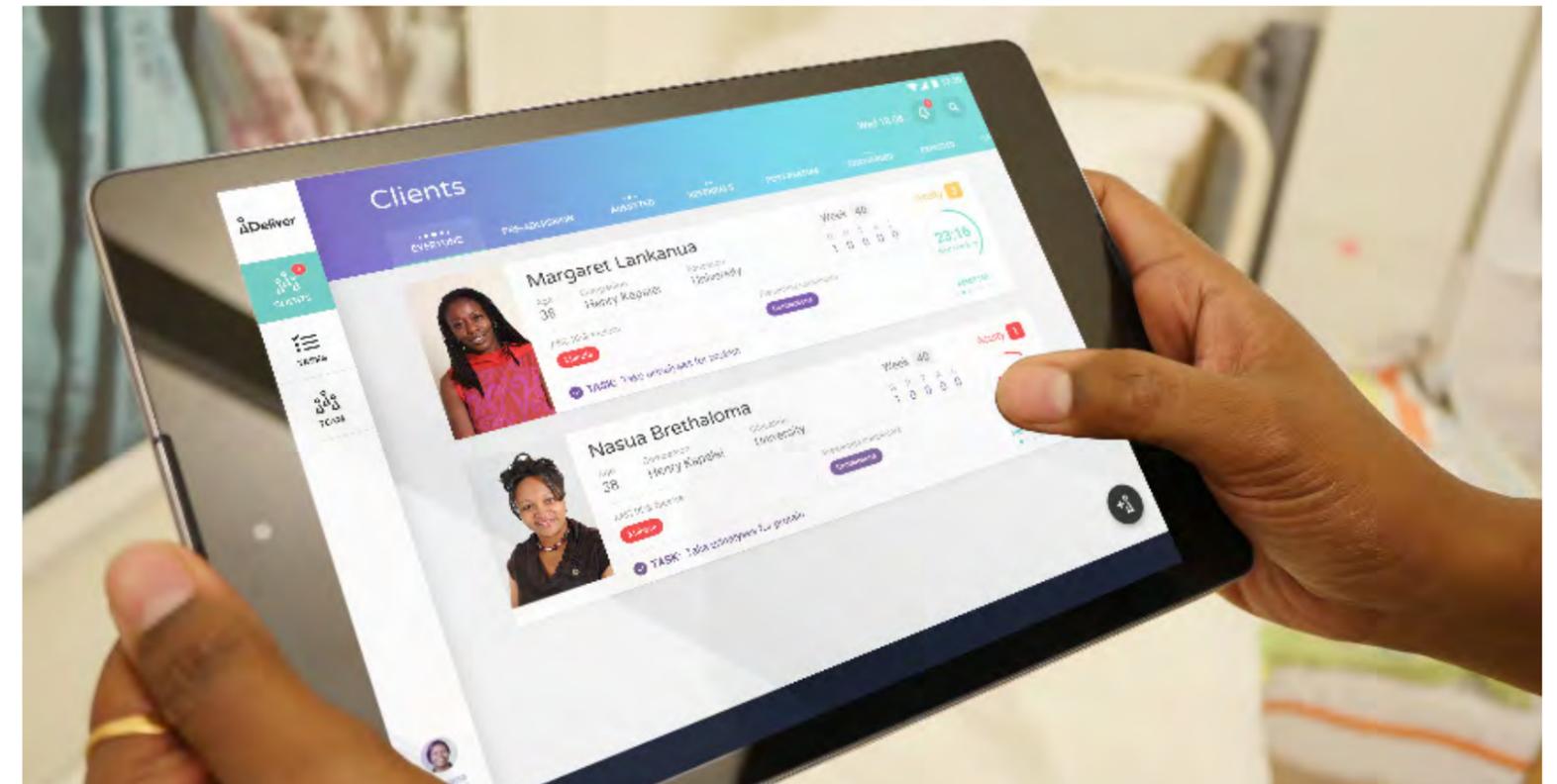
During the project, the team collaborated intensively with a technology innovation initiative called

iDeliver which is developing a **tablet based service tool** to support skilled birth attendants with data capture and documentation while providing decision support during the intrapartum care period. The tool is designed in a user centred approach and improves workflow and task management of the service provider and enables better communication between the provider and the client.

Mobile devices in iDeliver are connected on Local Area Networks and powered by grid or sun electricity. The client files and entered delivery data can be later transferred to the network through satellite or cable connections. The initiative is lead by Merck for Mothers.

Key areas that had been identified as opportunities for technological solutions:

- **Electronic medical records and reporting**
- **Labour and care process documentation**
- **Labour monitoring and timely decision making support**
- **Referrals**
- **Data collection and quality of care measurement**
- **Solutions for security and call for help**





Photograph by Helena Sandman

ARCHITECTURE

Lab.our Ward's spatial design facilitates the planned journey model and gives the client a sense of progress through the facility. The space is structured for ease of navigation and supports efficient work routines. With careful planning the solution can ease the stress of the client and enhance the tasks done by the facility staff.

Field research conducted in several low resource setting locations show that the organization of the maternity ward is frequently disjointed and there is often no clear route to move or work in the facility. This can be the result of faulty design or because the building was not originally constructed for such use. Also growth in capacity and new functions necessitate changes or additionally constructed spaces – leading to a compromised design.

The architectural work is led by four main principles:

1. LONGEVITY

Making design choices which support future growth and planned changes. It is inevitable that many of the decisions made today won't last long unless the solutions enable to change with the future needs. Modular solutions play a key role when planning a building which can evolve with future changes, demands and expectations.

3. COMFORT

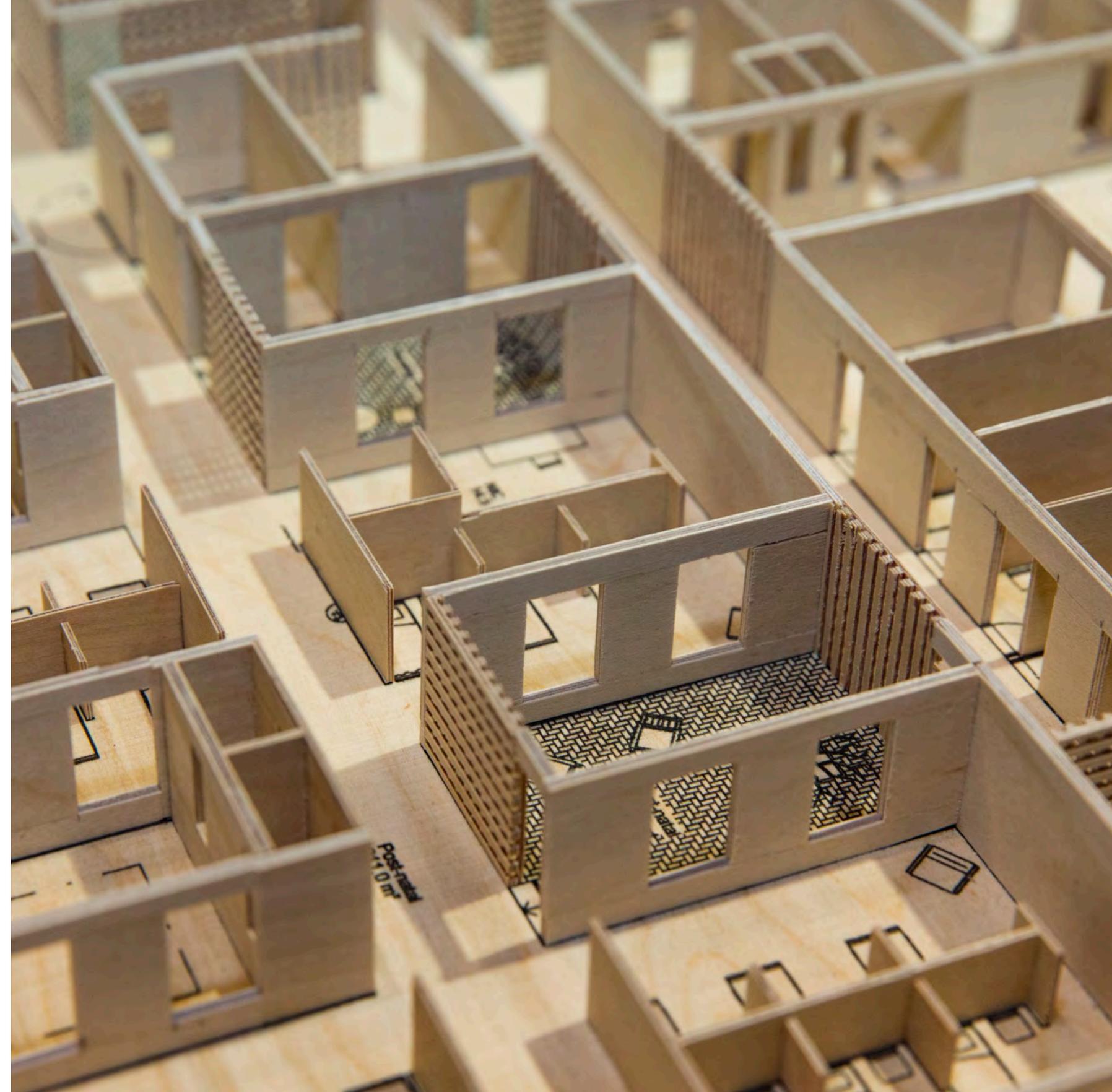
Thinking of how the clients and facility staff members are able to comfortably do their tasks and how the environment increases the positive feeling and outcomes of the clients maternal journey.

2. EFFICIENCY

Thinking of how the facility supports the daily activities in terms of work and client flow. Designing and constructing the buildings with simple and efficient methods with local sustainable materials and local workforce.

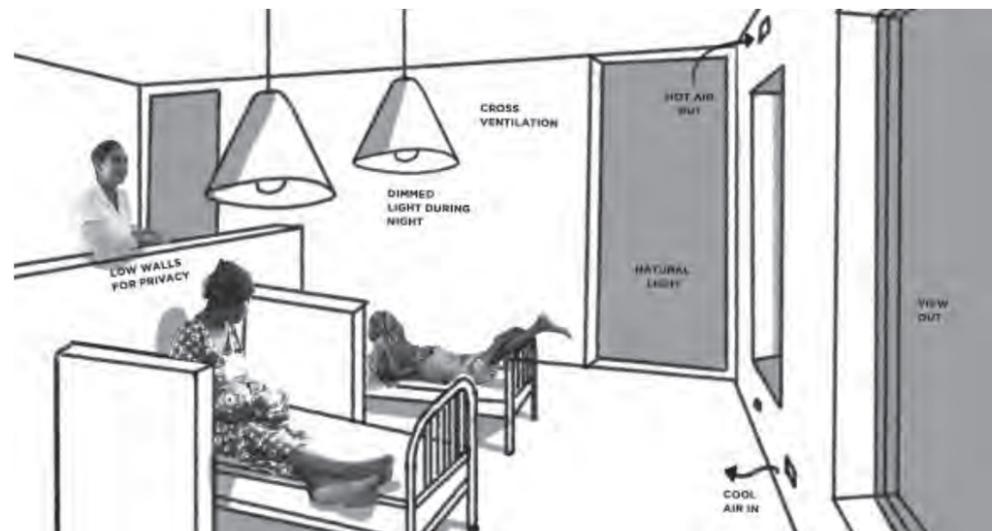
4. SUSTAINABLE

Planning for sustainable material, construction and infrastructure solutions which lower the footprint of the building, minimize running costs and extend the property's lifespan.



Privacy & Support

In many low resource settings, maternity wards may have very limited or no space for privacy and often lack an enabling culture for the companion to participate in and provide support during the childbirth process. Lab.our Ward delivery rooms are designed to be private - providing visual and acoustic barriers during a time when clients often feel the most vulnerable. Yet the space is large enough for one or two companions to be present during the childbirth process. The interior of the space is well organised - providing enough storage for equipment as well as space for a newborn corner.



Flexibility

Maternity wards can experience seasonal peaks and it is important to be able to adapt to changes in delivery volume. Client volume may vary according to the season, location and culture, but can noticeably increase the need for space. Currently many maternity wards and facilities do not have the resources or space to cope with seasonal change. By using a layout with a separate space for labour and having sufficient number of private rooms for delivery, Lab.our Ward eases the strain of seasonal change. During low season, clients may use the private rooms for a longer period of time by moving into delivery rooms in an earlier stage of labour. Time in private rooms is adjusted during the high season by ward staff.

Modularity

Lab.our Ward is based on a modular architectural plan which can be constructed according to various needs and sizes. The design work starts by studying the size and functional needs of the space and by formulating an estimation of how these needs may change in the future.

With a forward thinking plan, the facility is able to expand capacity or change functions by different extensions.



Locality & Colours

Lab.our Ward's primary architectural goal is to design a facility that appeals and fits to the local context – a facility which feels welcoming and interesting to visit. The facility should represent the local women and encourage them to seek maternity care and assistance. Childbirth is an individual process, and there should be space for local traditions and practices. Thus the buildings should be adapted to local culture, so that women feel welcome and at home.

The use of colour in space has a strong symbolic importance. Lab.our Ward uses colour by taking a step away from the hospital like environment, suggesting that the first impression of the ambience of the facility should be more homelike and inviting. However Lab.our Ward recommend to follow the use of certain colours based on past experience and scientific evidence. For example yellow is not recommended to be used for premature baby units, as signs of jaundice need to be easily detected. Green colour should be used in the operational theatres to counteract colour after-image from red wounds and blood. Furthermore, orange is favorable for the labour process to raise the energy. (H. Dalke et. al. , 2006)

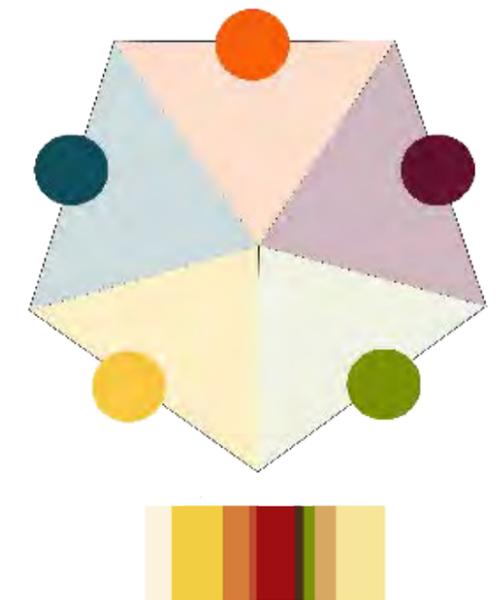
While it is not proven that colour is

curative, we do know that poorly maintained and suboptimally planned facilities can have a harmful effect on patients and staff (H. Dalke et. al., 2006). Colour used in interiors might appear to be of modest importance, but it has an impact on human perceptions and response to the environment (F. Birren, 1978). Even Florence Nightingale in the beginning of 19th century suggested that a variety of form and brilliance of colour in objects presented to patients are an actual means of recovery.

Colour selection should be done with an understanding of local culture and should reflect the local meaning of each chosen hue in order to add context as well as familiarity to the facility. It is important not to design a universal tonality, as culture and surroundings need to be taken into account in order to give relevance to the design and to the woman's experience of it.



Colour Palette, India.



Colour Palette, Kenya.

Wayfinding & Signage

Designing a well functioning space considers the activities and people who use the space. The architectural plan focuses on a natural approach, where movement in the space should be as intuitive as possible. A part of this experience are the colours which represent different functions. By using a colour indicator for each of the 5 steps of the labour journey, Lab.our Ward guides the people who enter a new area. The colours are used on floors and doorways, on signage and featured furniture such as the reception desk or delivery props. The signage is done with unified form, icons and texts.

“It took us more than an hour to find Admission.”

(Mother, Kampala)

Cleaning

Designing and building an environment for health care services requires careful planning, good materials and construction. To assist the facility’s cleaning personnel in performing their work well, the architectural solutions and material choices need to ensure that the surfaces are easy to clean and lasts hard scrubbing and stronger cleaning chemicals. Water and sewage infrastructure, electricity, oxygen and other systems needs to be well covered, yet easy to maintain, so that they do not hinder the cleaning procedures.

Ventilation

Lab.our Ward facilities consist of closed building blocks, semi out-door corridors and open-air courtyards designed for cross-ventilation throughout - which means the air can be continuously renewed. This helps to cool the building by natural ventilation, which reduces cost and is more environmentally friendly. Ventilation channels built into walls and inner courtyards also makes cross-ventilation possible: as hot air is lighter than cool air, the ventilation openings in the spaces are designed to let cool air in while the hot air rises and finds it’s way out of the building.

Natural ventilation and semi-outdoor spaces keep air moving and therefore help to prevent potential air conditioning system-associated bacteria from moving around in the facility. Natural air flow also reduces the risk of bacteria remaining within the facility.

Light and green walls

All the spaces are designed to have natural light as the primary light source. Whenever possible, Lab.our Ward designs the direction and position of the building to maximise the sun as a primary source of daytime light – thereby saving resources by minimizing the need for artificial light. Reflective light flows through overlapping roofs and ceiling lights illuminate the inner spaces through reflective walls.

Outside views are beneficial in feeling a connection with the outside world and being in touch with nature may have a beneficial effect on clinical improvement. (Ulrich RS., 2002) Maximizing the size and number of windows will allow light to enter the inner spaces and provides a view to the outdoors when suitable. Lab.our Ward facilities can easily be built without window panes - depending on the climate and available resources. If there are no window panes, the windows can have mosquito nets and a safety grill on the outside.

Sunlight in equatorial areas comes from the East in the morning and the West in the afternoon - meaning that the best position for windows in these regions is facing South and North in order to shelter the building from the afternoon sun. However, this is not always possible. If a space needs to have windows facing West, a cooling green wall



can be planted in front of these windows – providing shade which cools the air flowing into the building.

Most of the facilities studied during the research phase only provide light for clear visibility and do not consider the woman’s comfort. Research has shown that by adjusting light and providing a dimmed labour and delivery space the production of melatonin is increased, which in turn increases the production of oxytocin. This is one of the reasons women tend to go into labour during the night and why the labour stalls in brightly lit clinical environments. - Shannon Gede, Labour-

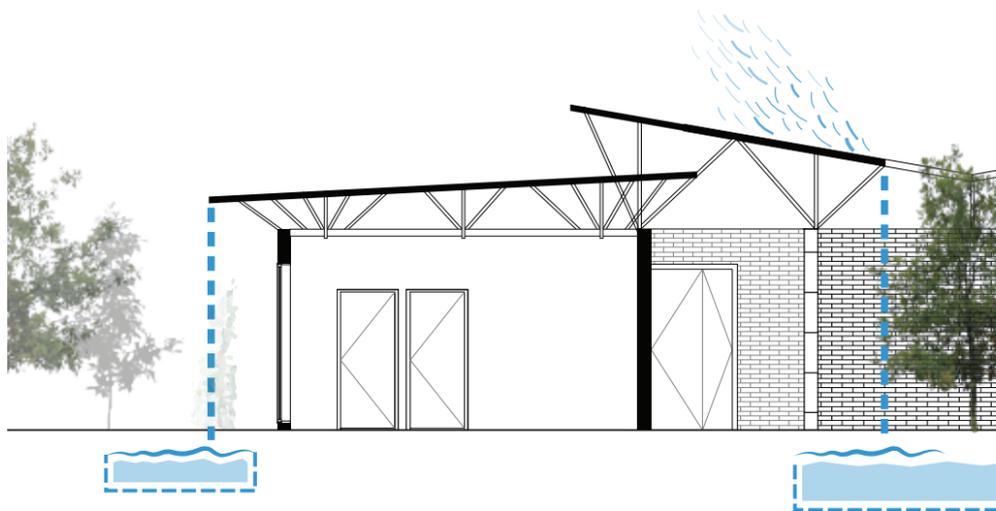
Delivery-Recovery (LDR) Room designs which facilitate non-pharmacological reduction of labour pain, Perkins & Will

Lab.our Ward’s architectural design addresses this issue by using a variety of artificial light sources and adjustments for natural light. For example, today’s LED lighting provides many adjustable and low voltage lighting solutions which are suitable for various uses such as work & spot lights, floor dimmers, ceiling and hanging lamps or as guidance light during the night. LED availability in a given location needs to be ensured before utilizing this approach in a facility.

Rainwater harvesting

Some locations are suitable for rainwater harvesting due to seasonal or regular rainfalls. For maximizing this effect, the roofs of the architectural models are designed to collect rainwater in the inner courtyards and from around the outer edges of the roof. The collected water is channeled through a piping and filtering system into an underwater reservoir. The size of the tank is calculated based on the size of the facility, estimated use and the amount and frequency of the rain in the region.

The ideal use for the collected water can be for toilets, cleaning and laundry purposes as well as for outdoor use. If the rainwater system is connected to hot water system the benefits are even greater.



Alternative power sources

Ideally the facility would run totally on sustainable power - which currently may be too costly and challenging to build. However It is important to build a reliable electric infrastructure with sufficient back-up system. When possible, it is also good to consider use of solar and wind power or other alternative methods such as biomass as fuel or thermosiphon for creating warm water. Lighting, information and communication systems that require less energy and can be powered through alternative methods are already commercially available - in some cases these could be considered as possible solutions for the new facility.

Materials

Lab.our Ward's facility is constructed by using as much local material as possible, both in the exterior walls and in the interior. The construction of new facilities should be both sustainable and meet the need for fast and durable construction in tough terrain and climate conditions.

One recommended solution is to use modules which are simple and if possible locally fabricated metal frames, filled with natural and locally available building materials. These Earth House frames can be installed with simple tools and with easy instructions. After installation of the frames, which is the structural base for the building, they can be filled with any natural materials like clay or reed as insulation. The frames are durable, reusable and affordable systems and they fit well in many locations around the globe.

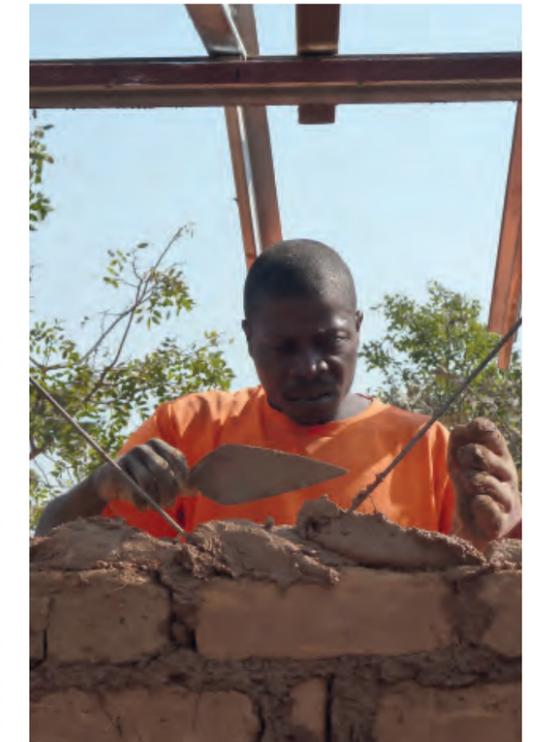
There are many material solutions available, which should be carefully studied before use for the construction. Local climate, as well as the risk of natural disasters such as earthquakes and floods need to be considered. However it is recommended to use clay

when it is suitable and locally available.

Clay is an ideal surface and construction material for hospitals and facilities. As a natural material, it regulates room air moisture and stores heat. It has good acoustic qualities and is a naturally fire safe material. It is very durable, breathable and keeps structural moisture at bay. Mould eventually finds its way into every structure - however, as clay is a natural material, the

toxins produced by mould are less harmful than those in synthetic materials. Clay is also antibacterial and may help to purify the air in enclosed spaces. It is

It is also a safe material to work with and it is relatively easy to learn how to plaster it. The finalized and treated clay surface is visually pleasing and has a modern look and feel and it can be reused and recycled without producing waste.





Photograph by Damaris Rodriguez

PRODUCTS

Lab.our Ward product concepts and recommendations aim to improve client comfort, safety and privacy as well as the provision of care. These supportive elements for services improve the interactions between health care providers and the client.

The product environment in a Lab.our Ward facility supports daily work routines and fits in the local context by being simple to use, reliable and easy to assemble and maintain. A well designed product environment, enables staff to develop and maintain a positive work environment while providing good quality of care. A place where clients feel safe and comfortable. This also helps management to maintain the facility in good operating condition and keep running costs low.

In resource constrained facilities, products can be old and in poor condition. This can be due to, among others, slow maintenance chain and non-availability of spare parts. In some cases the product design and materials are not suitable for their intended purpose or the product is not ergonomically designed or hard to use.

Since the environment is often challenging and finding alternative replacements for damaged goods, can be difficult with short notice, it is important to select solutions and design products which suit to the intended context.

Switching from short term solutions to long term planning and building a suitable product environment is very important for the facility to run properly. This might in some case increase the purchasing costs, but due to the lower running costs this can even out over time.

Concepts presented here are from a series of solutions designed to improve the comfort and personal control of the labouring woman. Some of the concepts are designed for care providers with an aim to increase their preparedness, improve ease of use and work routines while at the same time remain practical and fit the local context.

“We can only offer women one position to deliver.”

(Midwife, Bududa)



Delivery bed

Lab.our Ward supports the “Your delivery - Your choice” approach as a way to design solutions which enable the labouring woman to make more decisions and take better control of how and what would suit her best during childbirth.

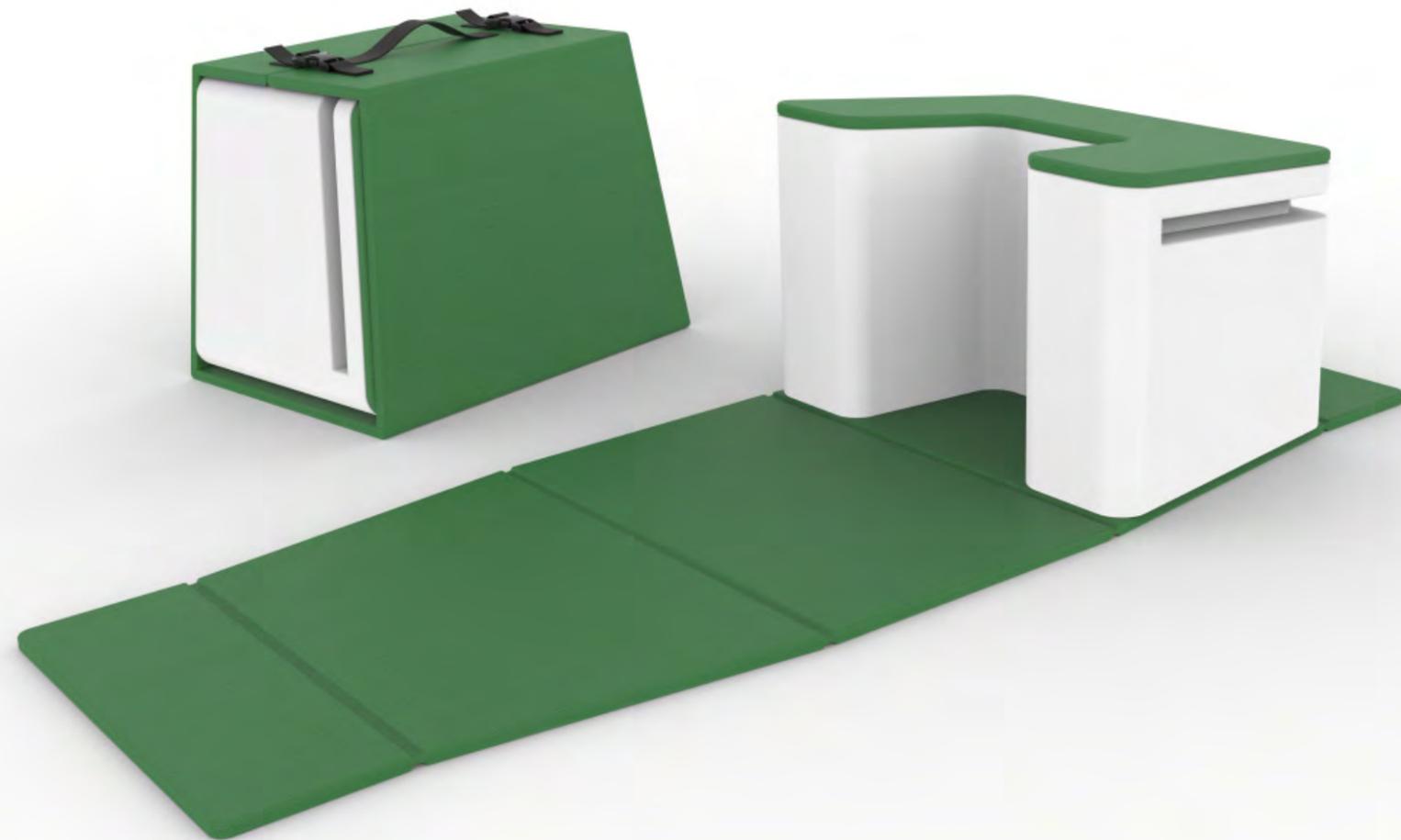
The Lab.our Ward delivery bed provides options for the client on how she is able to deliver. With alternative delivery positions and the possibility to move and interact with the product, alone or with a companion, she can find the most comfortable position which suits her preferences. This way the client gets more control over her own delivery and feels more empowered, which helps her to cope with stress and pain. The delivery bed is also comfortable and safe to rest in while starting skin to skin bonding with the newborn.



Measurement bowl

During delivery, it is important to measure blood loss in order to recognize postpartum hemorrhage. Often other bodily fluids (such as urine) are mixed with the blood, which affect accuracy. The offered solution is a stackable measurement bowl which can be easily removed or emptied if it is used to collect other liquids. Measurement lines inside help to estimate blood loss and prompt providers to act if necessary.

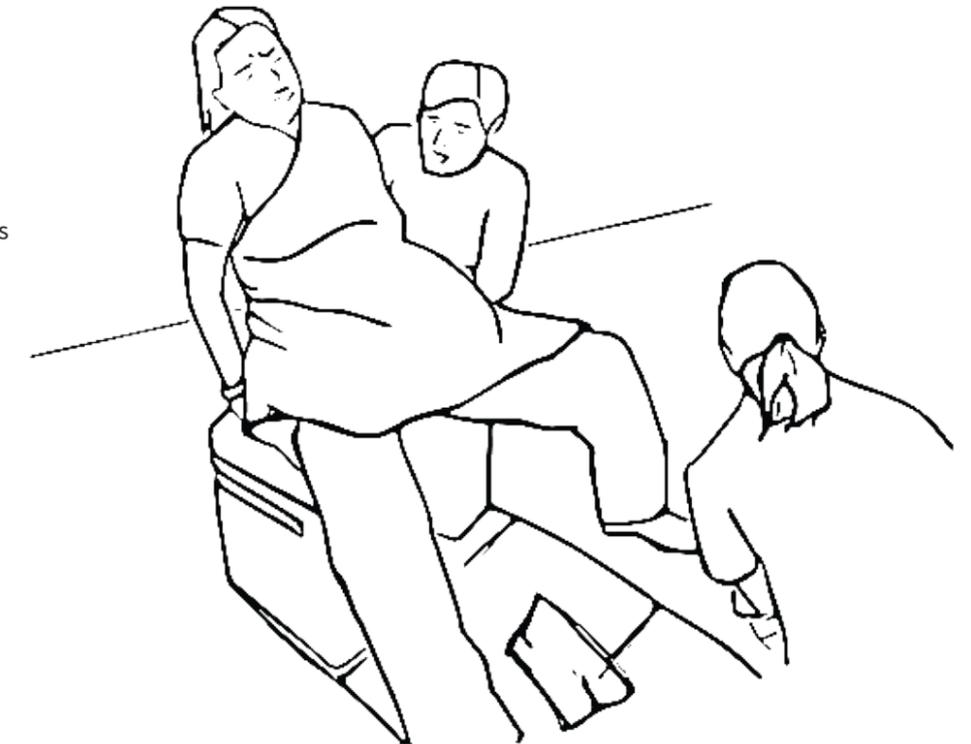




Delivery stool

The delivery stool is a product which is planned to be used as an alternative for the traditional high delivery table. The squatting position is a very old and culturally very widespread method for delivery. This position helps the mother to be close to the ground, get in a better position to open her pelvis and use gravity to her benefit. This position is also optimal for the companion to support during the process. For care providers this position might not be ideal – however this is where the focus needs to be shifted from the provider's side to the woman herself.

The stool is also designed to increase the preparedness of facility staff and other medical personnel. A set of basic instruments needed for the delivery is inside the stool and it can then be placed around the facility to be used for precipitous deliveries. This portable delivery set can be also placed in ambulances or transported for a home delivery.



Postnatal bed add-on's

The Bed add-on's are a series of products which increase the comfort and privacy of a client who is recovering from her delivery. These products are simple yet effective solutions for problems which were raised during the facility assessment visits. The products are easy to build and may be attached to various beds which are already in use.

1. Mosquito net holder

If the mosquito net is hung from the roof it is in wrong place if the bed needs to be moved due to rearrangement of the space. The net might also be hanging so high up that cleaning personnel don't ever remove it for cleaning. The offered solution is a holder which is attached to the end of the bed. This way the mosquito net can be hung on it and if the bed is moved the net will always follow. On top of the net we can also use a non-see through fabric which provides more visual privacy. There is also two IV-bottle hooks attached on the stalk of the net holder.

2. Newborn bed

The newborn should not be placed far from the mother. During recovery the mother might feel too tired or unable to move and if the newborn is placed on a high cot or even in another room initiation of breastfeeding and bonding is delayed. Beds are often also very narrow and sleeping with the newborn in the same space can be dangerous and it has effect on the quality of the rest. The solution is a small newborn bed which is attached to the postnatal bed, close to the resting mother. Thus they are able to continuously be in contact and mother can more easily breastfeed - even during the night or after cesarean delivery. Some mothers also feel more safe since the baby is constantly close by. This solution helps to support bonding routines which are vital during recovery.

3. Storage space

Privacy is an important aspect of client comfort and safety. Maternity wards are often small and overcrowded without any sufficient storage space available for personal belongings. Usually women and companions leave their belongings on the floor under their bed, which is often an unutilised space. While this is a solution, it does not provide security for the items and also prevents the cleaners from doing their work properly. The solution is a simple storage box or a shelf placed underneath the bed. These systems are easy to manufacture and can be placed on many existing beds. Since they are hanging from underneath the bed frame, cleaning of floor space will also be easy.





Trolley

The trolley is an extension for the service provided in facilities where the client has a limited amount of personal space and no other possibility to store her belongings. The trolley also helps her to be more mobile and walk more safely while in labour. It provides also support and a place to rest when needed. These trolleys can also be used as a wheelchair to transfer the client inside the facility if she is too tired or incapable of walking.

The frame of the trolley works also as a platform for other use. With simple extensions it can be turned to a newborn or supply trolley or be used as a janitor cart.



Designed and built for Clean – Solutions to support cleanliness, hygiene and infection control

To improve client comfort, as well as facilitate efficient work and safe health care procedures, it is advised to select product and material solutions which help to keep the facility clean and in order. Products which are designed well and manufactured from suitable materials are not only good in use but also easy to keep clean and maintain.

Lab.our Ward architectural plans and products are developed to support

smooth workflow and movement of staff. A clear floor plan with dedicated functional areas reduces movement inside the facility, thus cleaning routines and sterilisation procedures are more accurate and efficient. The architectural plans and product designs are developed by identifying and collecting recommendations for suitable materials and solutions which are designed for low and easy maintenance and better longevity to keep the facility pleasant and the environment safe to work in.

Infection Prevention and Control

Infection prevention and Control (IPC) is an important contributor to safe, effective and high quality service delivery. Hand hygiene is an important component of infection prevention and control in reducing the risk of healthcare associated infections.

The Lab.our Ward facility has hand hygiene materials and equipment readily available at points of care - strategically placed for staff members and clients to more easily follow hand hygiene routines throughout the client's journey from Arrival to Postnatal and discharge.

Hand washing and scrubbing stations are either elbow or foot pump operated to avoid the need for touching by hand.

An additional aim is to provide the client a possibility for shower and change of ward gowns during Admission and after Delivery. This would help to reduce spreading possible pathogens carried on body and clothing. This would also improve the welcoming feeling and help to identify clients in different stages of their care journey.

“I just realised there is nothing in the delivery room for the woman.”

(Doctor, Kampala)

Storage and Inventory

Lab.our Ward interior design solutions build a sufficient amount of closed storage space for equipment and inventory items - easing cleaning and maintenance routines by moving unnecessary items away from floors and horizontal surfaces such as tables

and open shelves. The storage spaces which contain inventory items are designed with double doors so that they can be checked and filled from both sides of the wall – improving efficiency while avoiding disruption to health work or client privacy.



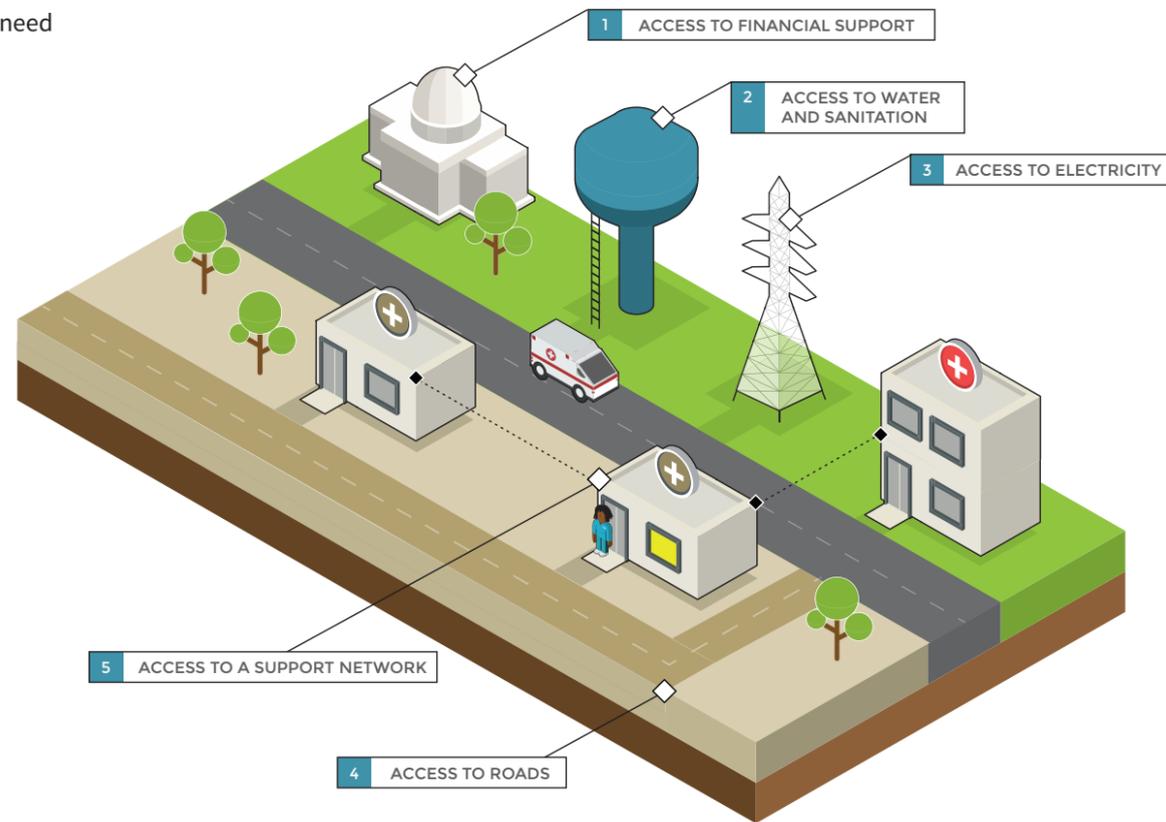


Photograph by Roopa Gogineni

INFRASTRUCTURE

The success of a design and improvement of maternity ward based on a woman's journey through childbirth is also influenced by the capability and reliability of the surrounding infrastructure. A well functioning maternity ward needs an enabling environment. While some of the infrastructural aspects can and have been already addressed through the designs in the Lab.our ward model, others need

to be taken into consideration outside the scope of this project. It is however important to summarize the key building blocks to ensure a well functioning environment and take these into consideration during the design process in order to maximize the positive results.



Environment

Environment is the collection of factors which creates the basis for a functional health care facility. This includes all the supportive policies, financing resources, information and understanding of what kind of constraints and effects the local disease burden and client loads might cause. The environment also includes information on how e.g. cultural perceptions and local education systems affect the function of the planned facility.

Network

The network is a collection of supportive elements which makes the new facility as part of the whole national health care system and improves its function. Through the network, this facility expediently refers clients who need specialized care or receives additional assistance upon request. Functional links to other clinics, partners and transportation routes also enables availability of supplies and commodities as well as transportation of laboratory samples, blood and information as well as maintenance. In addition, the stronger network between different professional groups enables the facility personnel to improve their own skills and to spread their knowledge further to other facilities.

Systems

Systems are the building blocks for creating the environment for any type of clinic or point of care. This means that there is a sufficient number of skilled human resources available for all the planned roles and tasks, including non-medical personnel. It is important to be able to provide private areas for screening and confidential discussions and arrange a sufficient amount of clean toilets and sanitation areas to ensure respectful, comfortable and safe care.

From the care providers' perspective private areas build a peaceful and efficient work environment which enables them to focus on the client and their needs. Well organised document and client record systems and functioning storage, transport, laboratory processing and reporting the results improve work efficiency. A facility also needs good communication networks inside and outside of the facility and functioning supply chain. It is also important to have access to reliable energy sources and methods to provide power and lighting, clean water, waste disposal and cold chain for the facility to run the services and activities well.

Information

Building a positive work environment and offering good quality and timely care includes the ability to access information and the possibility to update your knowledge. Personnel need accurate and well maintained patient records and information, which enables them to provide more valid and personalized care. They also need access to clinical algorithms and other medical decision-making tools, job-aids and manuals, which help them to perform their work well. As supportive tools, care providers need informative educational materials to communicate and provide counselling for clients and other family members. It is important that all of these informative tools are well designed, up to date and in easy to read and reach formats.

Tools

The tools are all the components which contribute to the actual functioning of the facility. This includes essential equipment and accessories, diagnostic procedures, drugs and supplies as well as vaccines to perform the signal functions of the facility. These components are recommended to be based on global standards, such as WHO and other relevant international organizations and updated annually. This can be adapted by users to fit local context in line with national standards.

NETWORK

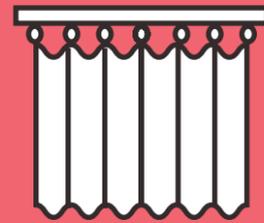
- Information
- Roads
- Means of Transportation
- Credible referral route
- Sample Transport lab
- Supply of commodities
- Maintenance Channel

SYSTEMS

TOOLS

INFORMATION

ENVIRONMENT



Private Area



Waste Disposal



Supply Chain



Toilet & Sanitation



Clean Work space



Cold Chain



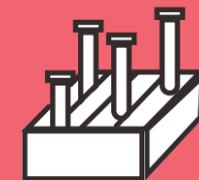
Power and Lighting



Document storage



External Communication



Sample storage



Clean water



Human Resources



Diagnostics



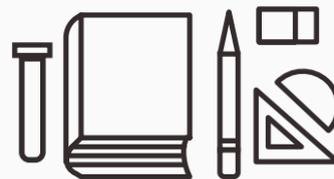
Drugs and supplements



Vaccines



Equipments and accessories



Educational materials



Job aids and manual



Patient Records



Clinical algorithm

FINANCING

DISEASE BURDEN

CULTURAL PERCEPTIONS

EDUCATION LEVEL

M4ID & THE TEAM

M4ID was founded as a social impact company in 2008 with an ambition to advance the global development and health field through creative problem solving and cross disciplinary collaboration.

M4ID's mission is to improve the development and health outcomes of vulnerable and underserved communities.

Together with our wide network of global partners, M4ID is uniquely positioned to support social change initiatives worldwide. In addition to working with civil society, Foundations, UN agencies, academia, and public sector partners, M4ID independently researches and develops new service and communication concepts, filling innovation gaps in the area of sexual, reproductive, maternal and newborn child health.

M4ID's model combines service design, creative communication and product as well as digital innovation with

development and health expertise. M4ID's projects involve researching and developing creative communication solutions as well as replicable process models and scalable service strategies. The outcomes are often a combination of new tools, products and services, innovations for improving existing interventions, national health systems and delivery programmes as well as creative awareness raising or advocacy campaigns and behaviour change solutions. M4ID employs a collaborative approach throughout activities and ensures active participation of national stakeholders in the planning, research, co-design, prototyping, testing, strategy development and implementation stages.

M4ID has long-standing experience in establishing effective working relationships and cooperation networks with researchers, community groups, innovation hubs and creative communication teams globally and in project countries. These form an integral part of the working process, ensuring local ownership of concepts and solutions, contextual relevance and

sensitivity as well as capacity building and skills transfer across project phases.

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ACKNOWLEDGEMENTS

The Project Advisory Group, a team of leading professionals with expertise in maternal and newborn child health, architecture and technology in low resource settings, provide guidance to the process.

France Donnay - Maternal Health Consultant

Bukola Fawole - Pioneer Director, National Institute of Maternal & Child Health, University of Ibadan

Jillian Foote - Associate Program Officer - Bill & Melinda Gates Foundation

Aparajita Gogoi - Executive Director - Centre for Catalyzing Change

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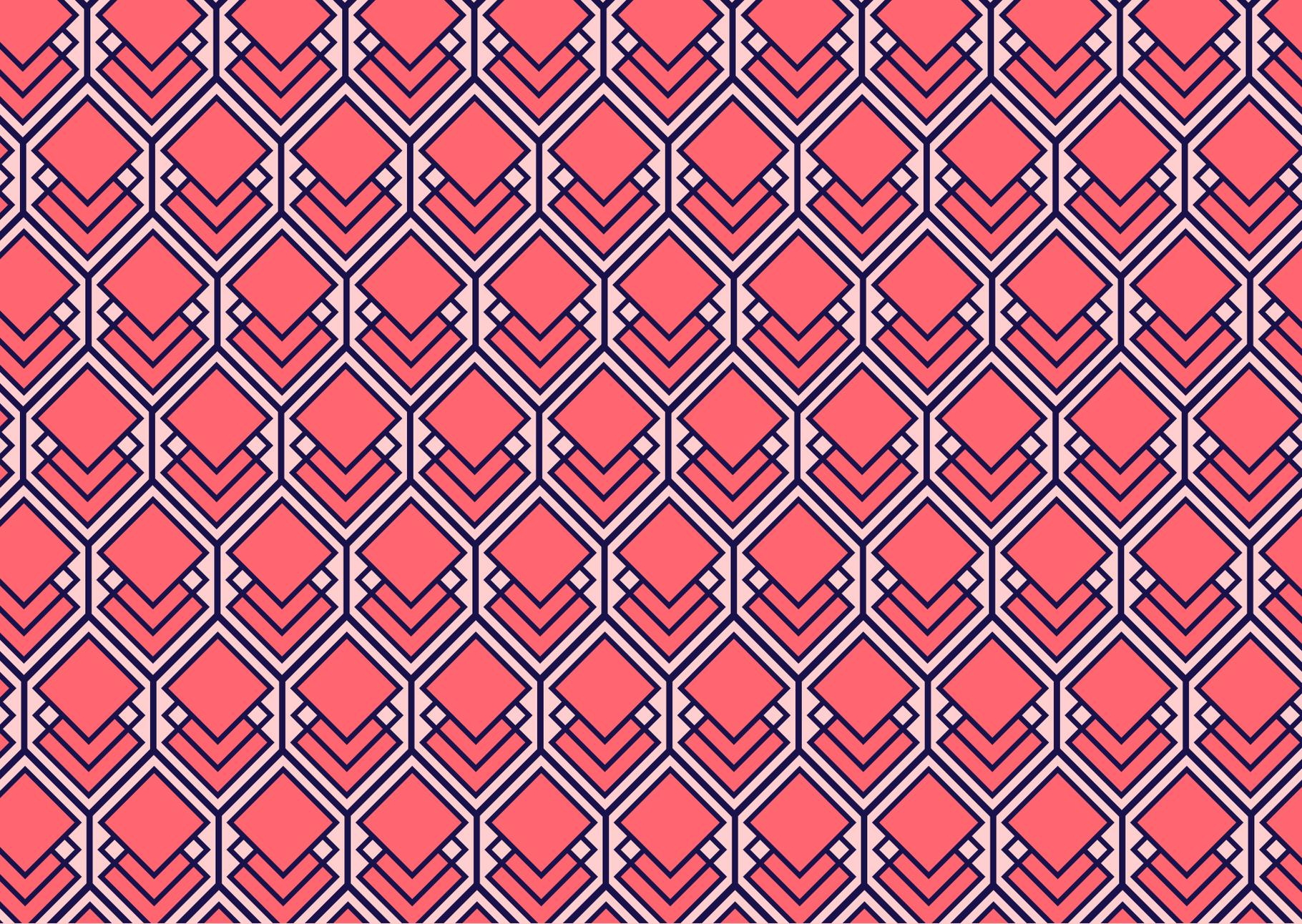
Priya Agrawal - Former Director of Merck for Mothers

The Lab.our Ward Project is designed and led by M4ID with funding and technical assistance provided by the



**Bill & Melinda
Gates Foundation.**

**Blurring the lines
between the design of
services, products, and
spaces allows for new
opportunities to emerge.**



M4ID
*Thinking and creating
for a better world*