

Preventing Maternal and Neonatal Infection in the Home: An Innovative Community-Based Approach

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Agenda

- Introduction to Jacaranda Health
- Scope of the problem
- Jacaranda Health's community based intervention
- Future steps: Monitoring and Evaluation

Jacaranda Health

- Jacaranda Health is building a network of private maternity clinics in resource-constrained settings.
- Mission:
 - Provide accessible, affordable, high quality services
 - Across the continuum of maternal and child care
 - Founded on evidence-based innovations and best practices.
- 10-bed Maternity Hospital in Ruiru, Kiambu County.



Jacaranda Health

- We provide antenatal care, normal deliveries, and postnatal, family planning and child wellness services.
- We have served over 3,000 low-income women and impacted nearly 10,000 family members
- Average client: 26 yrs, lives in informal settlements, has unreliable employment.

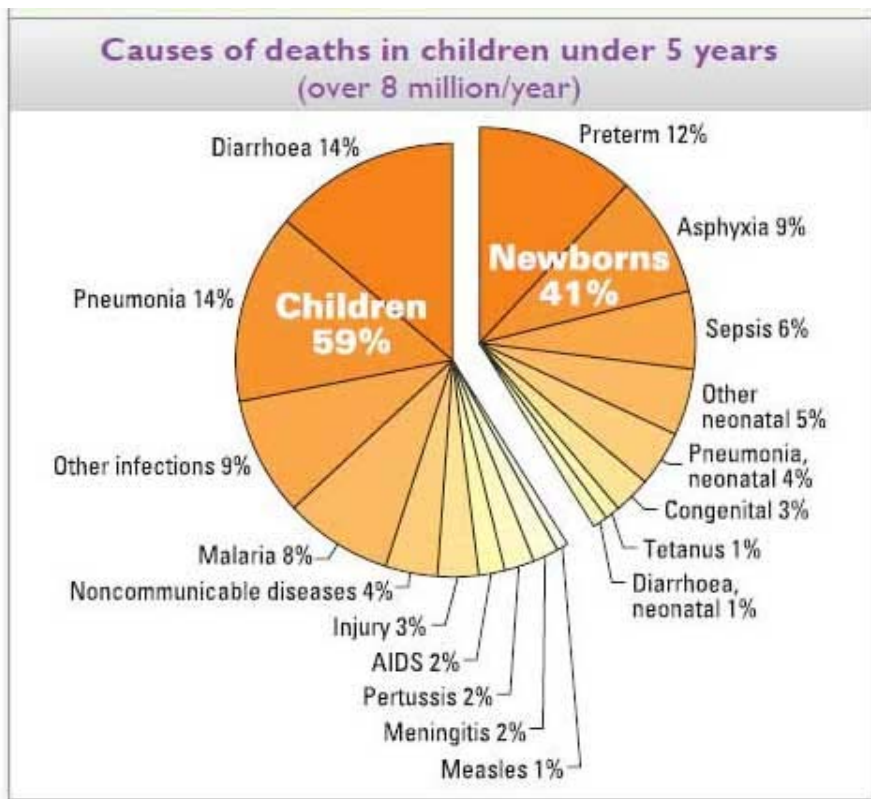


Scope of the problem

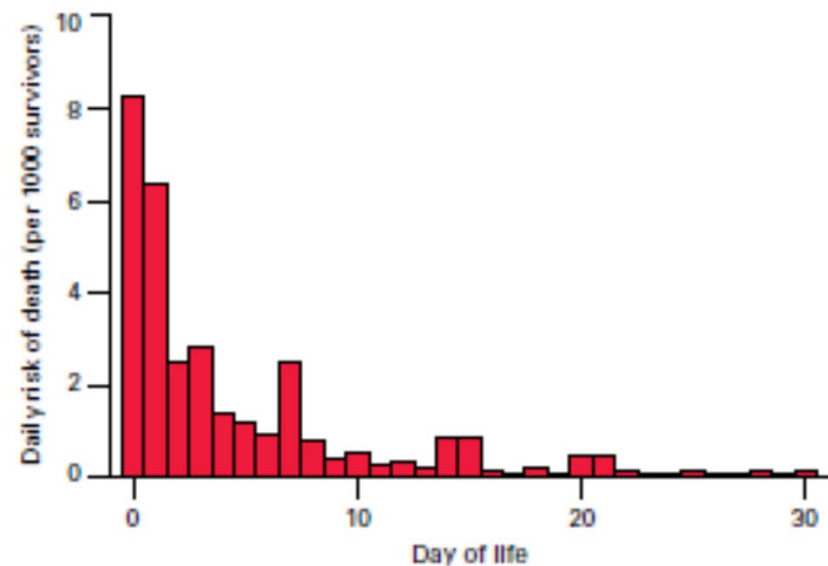
- Infectious agents in the community/ home pose a serious threat to mothers and neonates in the early postnatal period.
- Gaps in the continuum of care during the early postnatal period significantly impact maternal and child welfare.

Neonatal deaths

Infant mortality rate in Kenya (2011): 48/1,000 live births



Daily risk of death during the first month of life



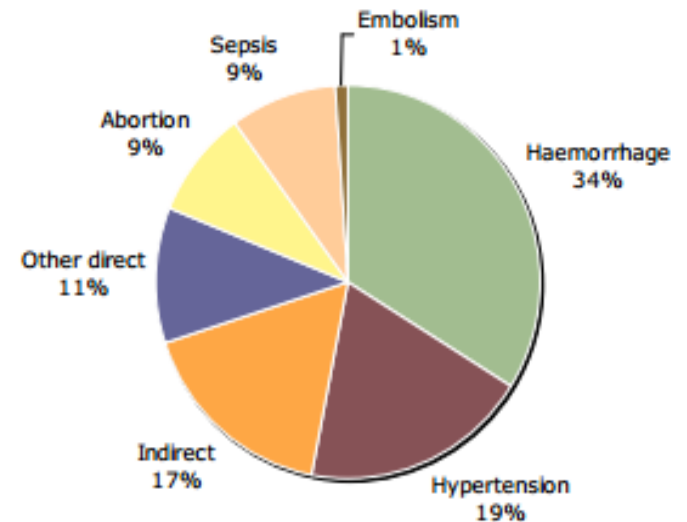
Source: Lawn JE, Cousens S, Zupan J. 4 million neonatal deaths: When? Where? Why? *Lancet* 2005; 365:891-900. (Based on 47 DHS surveys conducted from 1995-2003).

Maternal deaths

- Maternal mortality ratio in Kenya: 360/ 100,000 live births (2010)
- 5,500 maternal deaths/year

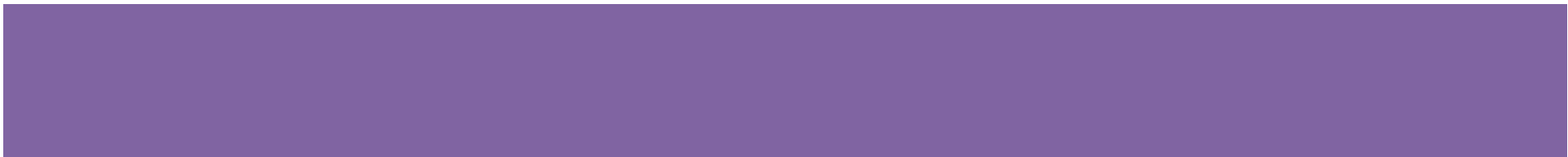
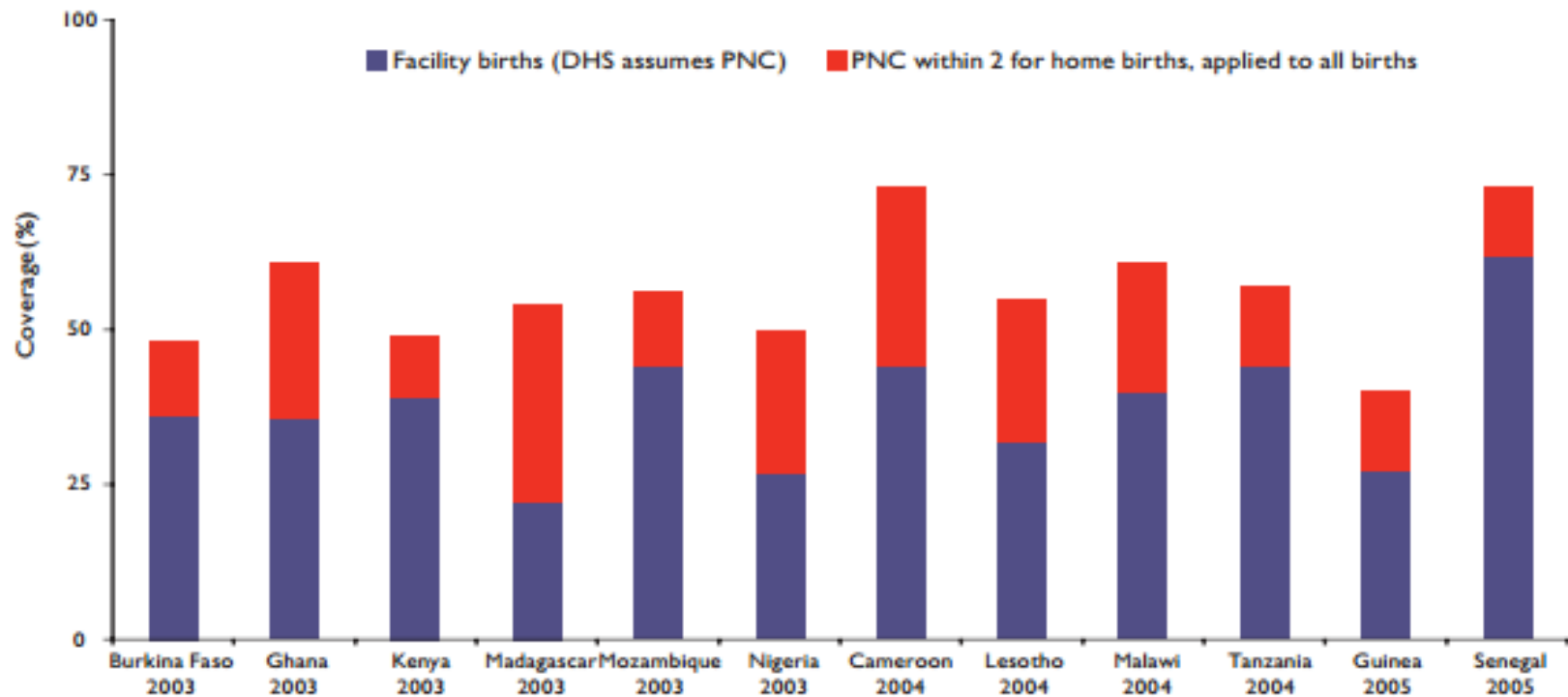
- Postpartum deaths:
 - 45% occur w/in 24 hours
 - > 65% within 1 week
 - > 80% within 2 weeks

Regional estimates for sub-Saharan Africa (1997-2007).²



Postnatal care provision

FIGURE III.4.1. Postnatal care within two days of birth in facilities (assuming all facility births receive postnatal care) or at home, according to Demographic and Health Survey (DHS) data in 12 countries (2003-2005)



How can women's lives be saved?



“Infection after childbirth can be eliminated if good hygiene is practiced and if early signs of infection are recognized and treated in a timely manner”

- Maternal Health Factsheet, World Health Organisation, 2013


Jacaranda's Postnatal Program

- Postnatal care program begins prior to discharge and continues for the first 6 weeks after delivery
 - Infection control, danger signs, caring for a baby and family planning education prior to discharge
 - Postnatal home visits or calls on day 3
 - SMS follow up for complications/ referrals
 - Customer services calls on day 10
 - Facility-based postnatal clinic visits on day 7 and week 6

Jacaranda Health's Community Based Intervention

- Postnatal home visit follow-up program
- Ensure safe transition to home for mother and baby.
- In-person and mobile phone follow-up 3 days after delivery.
- Targeted postpartum screening and health education provided by trained Community Health Workers (CHW)



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- Risk-based approach to infection prevention by identifying critical touch points within the home for the dissemination of microbes:
 - Kitchen: sinks, food products, cooking equipment, cleaning cloths (*Enterobacter, Klebsiella, E. Coli*)
 - Bathroom: sinks, toilet rims (*E. Coli, Salmonella, Enterobacter*)
 - Assess for signs and symptoms of maternal and neonatal infection, and educate patients on infection control measures.
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Postpartum Screening Checklist

POSTPARTUM SCREENING CHECKLIST

Complete for each call or home visit postpartum.

PROVIDER ID _____ DATE _____ TIME STARTED _____ TIME ENDED _____

Patient Information			
Name:	Contact Number:		
Jacaranda ID	Alternate contact number:		
Actual Delivery Date	Parity		
Date of Discharge	Postpartum Day (number)		
Mother's Screening		Abnormal	Normal
<i>First, I am going to ask some questions about how you are feeling since you left Jacaranda Maternity...</i>			
Since you came home from Jacaranda Maternity, have you had fever or chills?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
It is normal for women to experience vaginal discharge, but some discharge is a sign that you should see a nurse. Since your delivery, have you noticed any vaginal discharge that had a bad odor?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Since your delivery, have you experienced convulsions or loss of consciousness?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Since you came home from Jacaranda Maternity, have you had bleeding where you are soaking through a pad every hour?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Since your delivery, have you experienced any headaches, dizziness, or faintness?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Since your delivery, have you had any blurry vision or unusual trouble seeing?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Have you had any increased cramping or abdominal pain?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Have you had increased perineal pain (the area between your vagina and anus) that did not get better with pain medicine?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Since your delivery, have you experienced any difficulty breathing?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Have you had any difficulty passing urine?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Most women find that their breasts are painful and swollen after delivery. Have you noticed any redness in your breasts or tenderness that is hot to the touch?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Have you noticed that your nipples are cracked and painful?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Have you noticed any lumps in your breasts or swelling of your lymph nodes in your under-arms?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Baby's Screening		Abnormal	Normal
<i>Next, I am going to ask some questions about how your baby is doing since you left Jacaranda Maternity...</i>			
How many times has your baby breastfed in the past 8 hours?	<input type="checkbox"/> 0-2 times <input type="checkbox"/> 3 or more		
Look at the whites of your baby's eyes. Do they appear yellow in colour?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Look at your baby's eyes, again. Do they appear red, swollen, or do you see any discharge draining?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Press gently on your baby's palms and soles of your baby's feet. As the colour returns to does it appear yellow?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Is your baby sleepy all the time or not moving much?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Is your baby not responsive to being touched or crying less?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Listen carefully to your baby's breathing, is your baby making grunting noises when breathing?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Look at your baby's nose, do you see his or her nostrils flaring or widening as he or she breathes in?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
It is very important to keep your baby warm. Your baby's skin should be the same as the temperature of a normal adult. When you touch your baby's skin, do you notice that it feels colder than normal?	<input type="checkbox"/> Yes <input type="checkbox"/> No		



Touch your baby's belly, does he or she feel hot in comparison to your body?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Has your baby had any fits? For example, have you noticed your baby suddenly become very stiff or started to shake?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Look at the areas on your baby's belly where the cord was attached. Is it red, swollen, or draining pus?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Counseling	
✓ Mark if completed	
<input type="checkbox"/> Breastfeeding <input type="checkbox"/> Feeding every 2-3 hours (more than 8 times per day) <input type="checkbox"/> Feed at night and day <input type="checkbox"/> Signs of good attachment: baby's chin touching breast, mouth open wide, more areola (dark part of nipple) seen above than below the baby's mouth, lower lip turned outwards	
<input type="checkbox"/> Danger Signs: Mother <input type="checkbox"/> Severe bleeding (more than 1 pad in an hr) <input type="checkbox"/> Severe lower abdominal pain <input type="checkbox"/> Foul smelling vaginal discharge <input type="checkbox"/> Fever <input type="checkbox"/> Severe pain/swelling/redness of perineum <input type="checkbox"/> Difficulty urinating <input type="checkbox"/> Headaches/blurry vision <input type="checkbox"/> Heat, pain or lump in breast	
<input type="checkbox"/> Danger Signs Newborn <input type="checkbox"/> Fever <input type="checkbox"/> Jaundice (yellow palms, eyes, soles) <input type="checkbox"/> Not feeding well <input type="checkbox"/> Lethargic/Not responsive to touch <input type="checkbox"/> Redness, discharge from umbilical cord <input type="checkbox"/> Convulsions/fits <input type="checkbox"/> Abnormal breathing (grunting, nasal flaring, fast breathing) <input type="checkbox"/> Redness or pus from eyes	
<input type="checkbox"/> Cord care <input type="checkbox"/> Keep cord clean and dry <input type="checkbox"/> No applying anything to stump <input type="checkbox"/> Stump outside nappy	
<input type="checkbox"/> Thermal care <input type="checkbox"/> Dress newborn in several layers of clothes <input type="checkbox"/> Bathe baby quickly in warm water, dry and dress quickly <input type="checkbox"/> Warm room where mother and baby stay	
<input type="checkbox"/> Hand hygiene <input type="checkbox"/> After using the toilet <input type="checkbox"/> Before touching or holding baby <input type="checkbox"/> After washing or disposing of newborn nappies	
<input type="checkbox"/> Family planning <input type="checkbox"/> Healthy spacing 2 years <input type="checkbox"/> A woman can get pregnant again after 6 wks--partially breastfeeding, 6 months if exclusively breastfeeding <input type="checkbox"/> IUCDs can be used for up to 12 yrs <input type="checkbox"/> IUCDs cannot move anywhere else in the body <input type="checkbox"/> IUCDs cannot cause infertility <input type="checkbox"/> IUCD side effects include heavy bleeding, spotting <input type="checkbox"/> Implants can be used for 3-5 yrs <input type="checkbox"/> Implants cannot move anywhere else in the body <input type="checkbox"/> Implants cannot cause infertility <input type="checkbox"/> Implants side effects include reduced to no period, weight gain or loss, spotting <input type="checkbox"/> To make breastfeeding a birth spacing method a woman has to breastfeed exclusively (every 2-3 hours, night and day), not give baby supplemental foods, and no return of periods)	
<input type="checkbox"/> Increasing comfort postpartum <input type="checkbox"/> Sitz baths <input type="checkbox"/> Walking <input type="checkbox"/> Pain medication (paracetamol/brufen)	
<input type="checkbox"/> Maternal nutrition <input type="checkbox"/> Take additional fluids and food <input type="checkbox"/> Important to take protein (types include beans, meat, lentils, fish, chicken)	
Comments and Jacaranda Follow-Up	
Document any referrals, concerns, or questions for Jacaranda Maternity follow up	
CHW Name: _____	CHW Signature: _____ Date: _____

Postpartum Screening Checklist

- Checklists create:
 - Support for counseling and health education
 - Reminders to promote completeness of assessment and documentation
 - Decision support
 - Referral for signs and symptoms of infection
 - Ensure standardization and quality

Patient Education

- One-on-one patient teaching and demonstration
- IPC topics of education include:
 - Umbilical cord care
 - Hand hygiene
 - Identification of danger signs

Cord Care
<p>*The umbilical cord is the tube that connected the mother to the baby during a pregnancy. This is how the baby gets oxygen and nutrition. The umbilical cord is cut at birth, and a small part of it remains in the belly button for the first few weeks. This is called the umbilical stump.</p> <p>*You can see the umbilical stump in the picture below.</p>

<p>*Infections of the stump can make the baby very unwell. To avoid infections, keep the area clean and dry until the stump heals, dries, and falls off.</p> <p>*Do not cover the stump with a nappy or diaper.</p> <p>*You can clean the stump by wiping it with a piece of wet cotton and drying it immediately. The stump may get wet when you bathe the baby, just lightly pat it dry after the bath.</p> <p>*Do not apply any products or medications on the stump unless told to do so by a medical professional.</p> <p>*If the stump or surrounding area is red, hot, swollen, bleeding, or has pus on it, this is a medical emergency. Speak to a Jacaranda nurse for advice about treatment immediately.</p>
<p>To speak to a Jacaranda nurse about any concerns or questions, call 0732-668437</p>
Cleanliness & Hygiene
<p>*Clean and dry your baby every time he or she passes urine or stool.</p> <p>*Young babies can pick up infections very easily. Therefore, it is important for everyone who looks after the baby to wash their hands regularly with clean water and soap.</p> <p>*Wash your hands immediately after using the toilet to pass urine or have a bowel movement, before touching your baby.</p> <p>*Wash your hands immediately after changing your baby's nappy or cleaning your baby.</p>


Patient education

NUTRITION

TAKING CARE OF YOURSELF AND YOUR BABY DURING PREGNANCY

WHAT SHOULD I EAT DURING PREGNANCY?

During your pregnancy, eat three meals plus one snack every day.

- If possible, try to eat different types of locally available foods instead of the same thing everyday.
- Avoid taking tea or coffee with your meals as they can prevent you getting enough iron
- If you use salt, make sure it is **iodised**. This prevents many illnesses in pregnant women and in the new baby.

Grains: Rice, Wheat, Maize, Millet, Sorghum

Beans, Lentils, Peas, Groundnuts, Seeds

Meat, Chicken, Fish, Eggs, Milk products

Roots: Potato, Cassava

Fresh fruits and vegetables



- Always wash your hands with soap and water before starting to cook or eat.
- Wash all vegetables and fruit before cooking or eating them. Do not overcook your vegetables, as this takes away the healthy nutrients.
- Cook meat, fish, and eggs until they are fully cooked all the way through.
- Take iron and folic acid tablets during your pregnancy. The iron assists in your blood to provide oxygen to the baby.
- The folic acid assists in the baby's normal development.
- It is best to take these tablets when you are eating a meal and drink at least 6-8 glasses of fluids a day. This can be water, juice or milk. Try to avoid coffee.

HOW DO I AVOID INFECTION?

- Consult your doctor or nurse/midwife
- To prevent malaria, sleep under an insecticide-treated bednet during your pregnancy. These are free from the government to pregnant women.
- If you have signs or symptoms of malaria, seek medical advice and start treatment early.

HOW MUCH SHOULD I EXERCISE?

- It is safe and good to do light exercise for example walking and stretching during your pregnancy.
- If possible, do not carry heavy loads or do vigorous activity.

WHAT ELSE DO I DO TO TAKE CARE OF MYSELF?

Rest and Sleep. Your body uses a lot of energy during your pregnancy, so you will need a lot of rest.

- Try to rest for at least one hour extra during the day.
- You may need to rest more during the last 3 months of your pregnancy.
- Do not smoke or drink alcohol during your pregnancy as this can be very harmful for your baby.
- Do not take herbal medications during your pregnancy without asking for medical advice first
- Do not take any medicines during your pregnancy that have not been prescribed by a nurse or doctor. Some medications can be very harmful to babies in the womb

IF YOU HAVE ANY QUESTIONS OR CONCERNS, YOU CAN CONTACT A JACARANDA MIDWIFE ON 0732668437 AT ANY TIME, DAY OR NIGHT.



DANGER SIGNS IN A YOUNG BABY

Young babies can become seriously ill very quickly. It is important to understand danger signs in new babies, so you are able to get help quickly. If you see any of the following danger signs in your baby, come to Jacaranda Maternity or call Jacaranda on 0732668437



- Baby has difficulty feeding, suddenly feeds much less than it did before, refuses to feed 2 - 3 times in a row, or feeds less than 8 times in 24 hours.
- Baby has a swollen stomach and vomits after most or all
- Vomit that is green or blood stained.
- Baby has less than 6 wet nappies in 24 hours.
- Baby produces no stool in the first 48 hours.
- Diarrhoea, or bloody, black or dark purple stools.



- Baby seems drowsy, less active, or very sleepy and difficult to wake.



- Baby feels very hot or very cold to touch, or is sweaty or shivering



- Baby has difficulty breathing, is breathing fast, breathes so you can see its ribs showing, or is grunting while breathing.
- Paleness or white/ faded pink colouration to palms of hands and bottoms of feet.

DANGER SIGNS IN A YOUNG BABY

Illness in a new baby can become serious very quickly. It is important to understand danger signs in new babies, so you are able to get help quickly. If you see any of the following danger signs in your baby, come to Jacaranda Maternity or call Jacaranda on 0732668437



- Baby has swelling, redness of skin, bleeding, or foul smelling pus around the umbilical cord. This can be a sign of infection of the umbilical cord.
- Infection can spread from the umbilical cord to the eyes. If the baby has red, swollen eyelids or yellowish pus in the eyes, this can be a sign of infection.



- Baby has a fit or convulsion.
- Baby is crying, being fussy or twitching, and doesn't improve or settle with cuddling and comfort.

- Baby has yellowish skin, eyes, chest, palms of hands or soles of feet. This is a sign of jaundice.

It is not always easy to tell if your baby is unwell. If you have any worries about your baby's health, you should seek medical advice immediately.

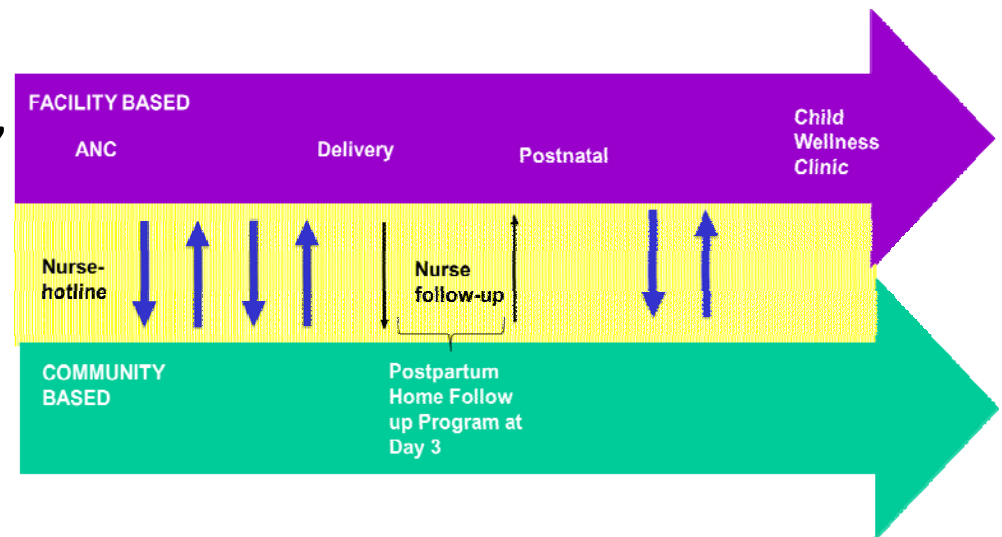
• Continue to feed (ideally breastfeed) your baby while you travel to and wait for medical care

It is difficult to predict when a baby may become unwell. Illness in a newborn is an emergency and therefore it is best to be prepared in advance. Preparation includes:

- Choosing what health centre or hospital you will go to if a complication arises.
- Deciding what transportation you will use to get to the health centre or hospital.
- Putting some money aside for your transport and medical costs.

Facility-community linkages


- Midwife staffed hotline provide direct connection to clinicians 24 hrs.
- Nurse provides mentorship, professional development, management, and support for Community Health workers in program.
- Nurse conducts phone follow-up for clients referred during CHW visit/call.



Challenges

- Viewed in similar way to community-based health HIV follow up program
- Preference for home visits rather than follow-up calls
- Expectations of “gift” for visit or financial support/ reimbursement for referral costs

Innovation

- Addressing notable gap in continuum of care
 - Task-shifting: sustainability and cost-effectiveness
 - Giving patients ownership of their health and wellbeing through education and training
 - Providing patient-centred care within the community
 - Encouraging facility-community ties
 - Integrating IPC into the continuum of care services provided
 - Utilisation of mHealth and technology
- 

Future Steps: Monitoring and Evaluation



- Systematic evaluation through surveys and knowledge-based testing of control and intervention groups within the community, and referral and follow-up numbers
- Evaluation project funded by Saving Lives at Birth (SLaB) and Grand Challenges Canada
- Dissemination of findings to wider audience:
 - Government stakeholders (DHMT, etc.)
 - Healthcare providers
 - Academia (papers, conferences, etc)

Questions?



Referrals

- Nurse home visit program:
 - 33 home visits
 - 3 referrals (2 neonatal – jaundice/ 1 maternal – ? Infected episiotomy)
- CHW home visit program:
 - 30 home visits
 - 30 calls
 - 6 referrals (5 neonatal – jaundice, cord infections, feeding problems/ 1 maternal - mastitis)

Cost

- Major cost: staff time
- Lesser costs: transport, airtime
- CHW home visit cost: Ksh 320-450 per visit (depending on location)
- CHW call cost: Ksh 120-230 per call (depending on duration of call)
- Nurse home visit cost: up to x2 CHW visit cost
- Anticipated cost per visit will decrease as volume of visits increases.

Evidence-base

- Analagous studies:
 - Syria: midwife-led home visits improved breastfeeding practices (Bashour et al, 2008)
 - Zambia: midwife-led home visits – reduced neonatal problems and referrals (Ransjo-Arvidson et al, 1998)
 - Nepal: health worker home visits improved uptake of postpartum family planning (Bolam et al, 1998)
 - Ghana/ Malawi/ S. Asia: CHW or lay HW-led home visits reduced neonatal mortality (Gogia and Sachdev, 2010, Baqui et al 2009, Kirkwood et. al 2013, Zimba et al 2012) and improved health-seeking behavior (Kirkwood et. al 2013)
 - Sri Lanka/ Bangladesh: CHW-led home visits improve initiation and maintenance of exclusive breastfeeding (Senrath et al 2012b; Haider et al. 2000)