birth

Maternal & Child Health

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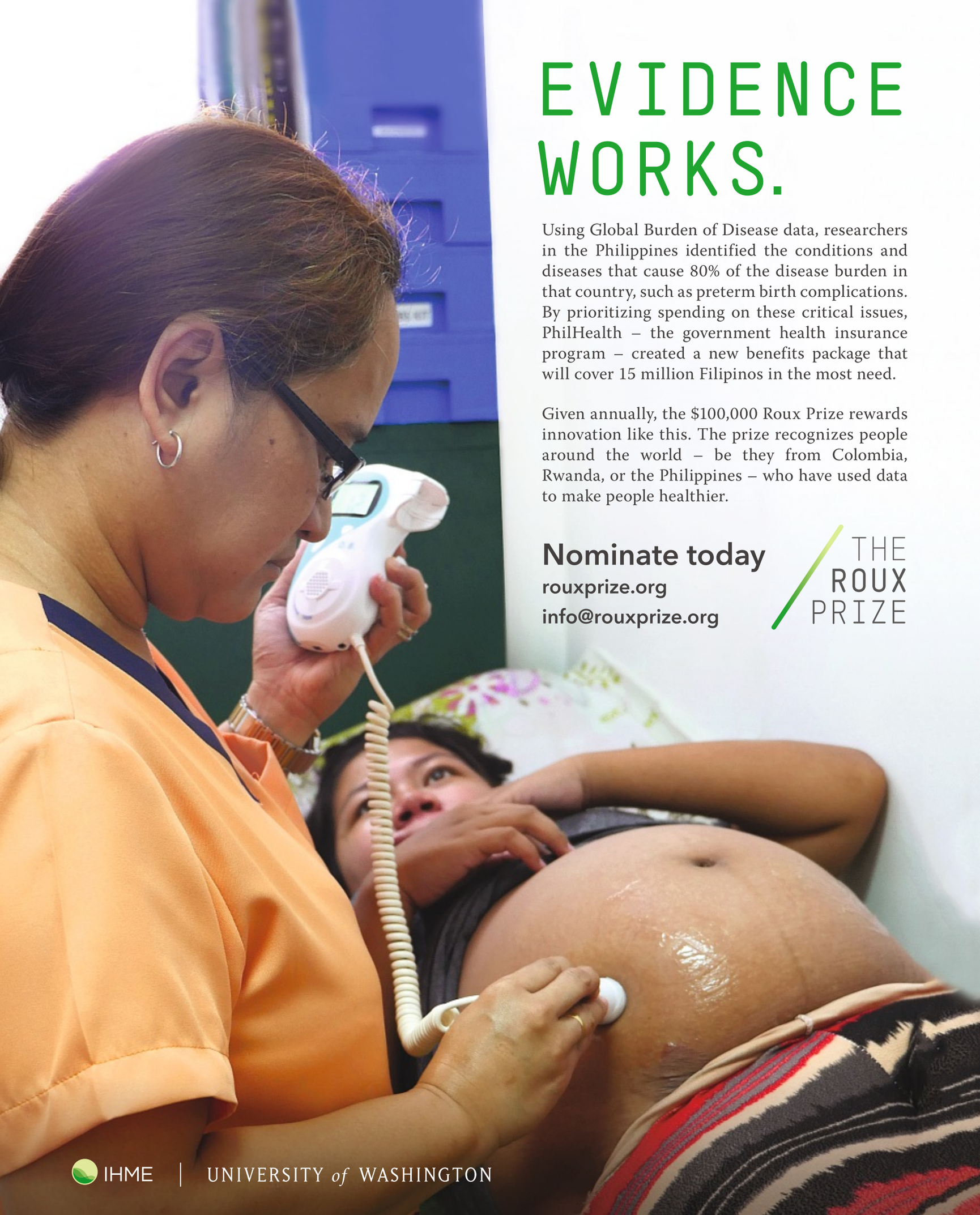

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Maternal and child mortality rates from World Bank data

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PHOTO: KATE HOLT

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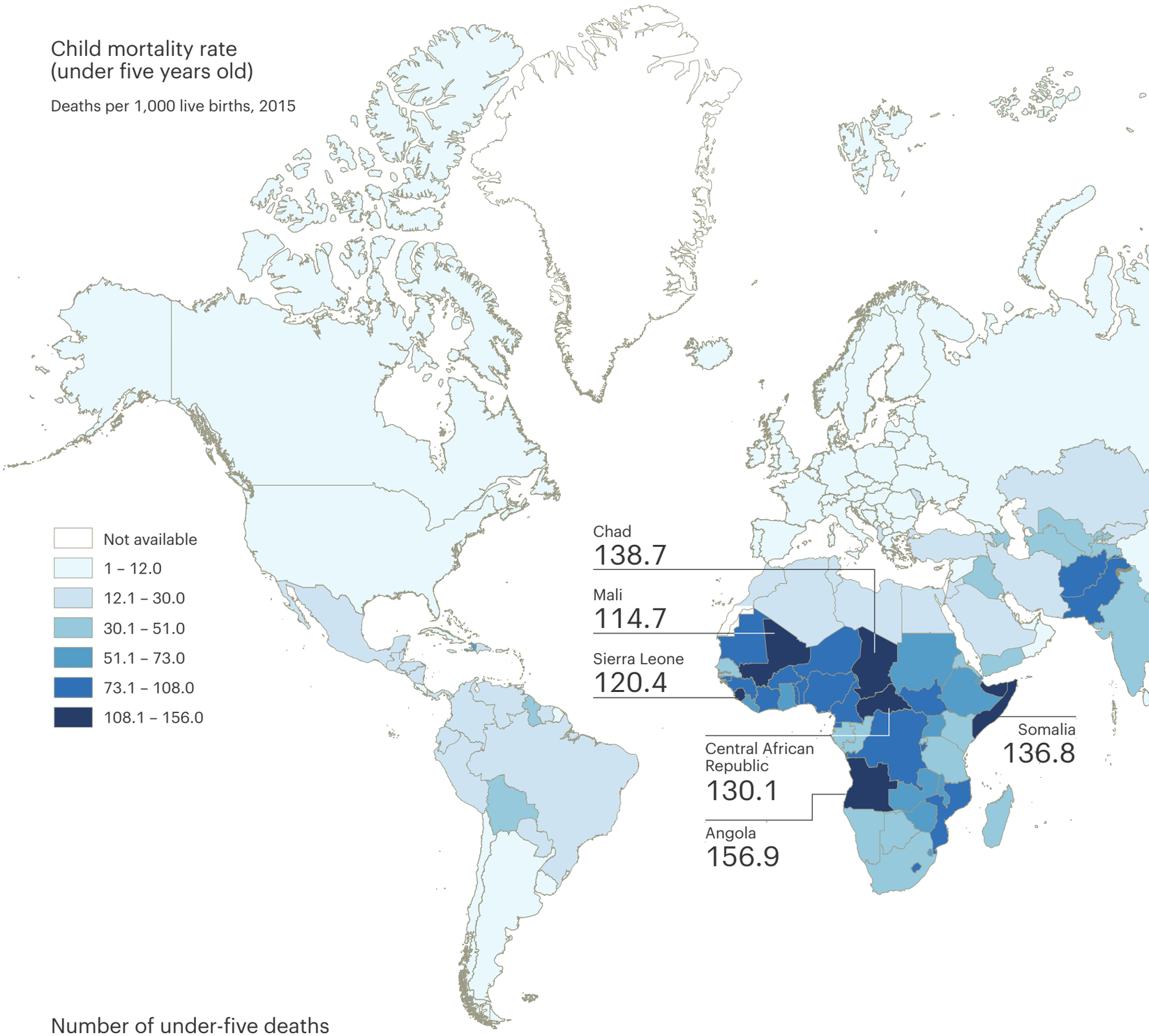
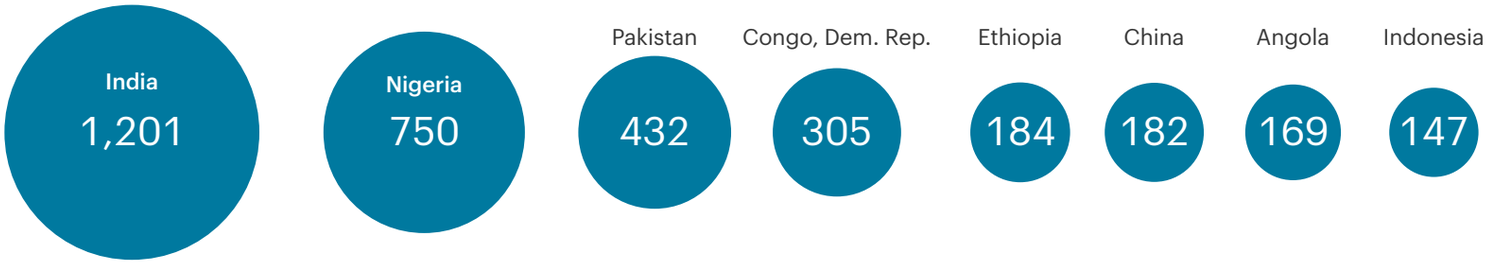
Child mortality rate (under five years old)

Deaths per 1,000 live births, 2015



Number of under-five deaths

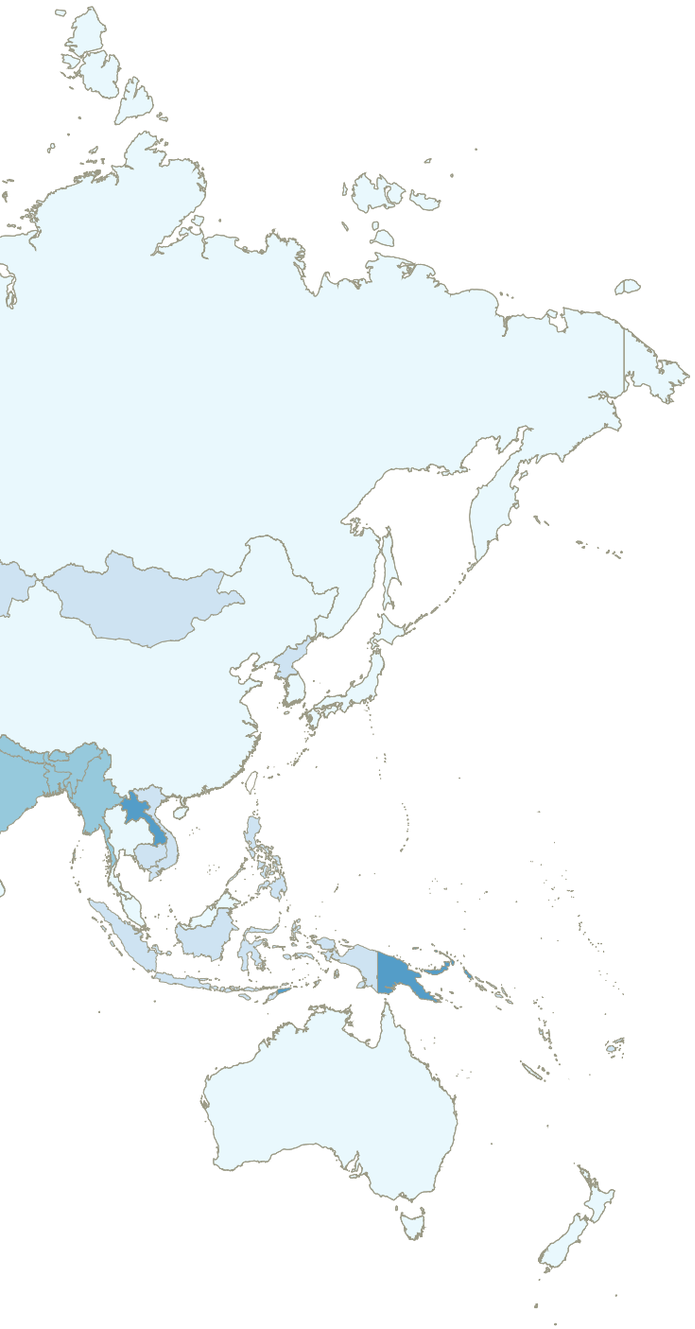
Thousands, top countries (2015)



Caring for a growing world

Innovations in healthcare aim to ease the pressures affecting mothers and their children around the world

By **Andrew Jack**
Graphics by **Russell Birkett**



Bangladesh	Tanzania	Afghanistan	Sudan	Niger	Uganda	Chad
119	98	94	89	88	85	83

Source: World Bank

Jorge Odón, an Argentine car mechanic with a talent for invention, woke up in the middle of the night in 2006 with an idea. He had recently watched an online video showing how to easily extract a cork from inside an empty wine bottle using an inflated plastic bag. Until then, all of Odón's patented inventions had been related to mechanics, but it struck him that night that the technique could be adapted to replace forceps-assisted births.

The idea's potential also intrigued Mario Merialdi, then co-ordinator of human reproduction at the World Health Organisation. In 2008, he was attending a conference in Buenos Aires and granted Odón a 10-minute meeting after an introduction by a mutual friend. "When I saw the device, I never went back in [to the conference]," he recalls.

Eight years later, a partnership to develop and commercialise the Odón device — which incorporates a simple applicator, bag and hand pump and requires almost no specialist knowledge to use — has advanced substantially. Becton Dickinson, a US medical technology company, has pledged $20m to the project, designed to make the device affordable in low and middle income countries. "This is a test case of whether

An estimated 225m women and girls in developing countries still have an "unmet need" for contraceptives

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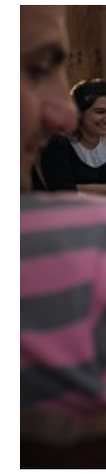

innovation can be taken to scale. It's really important," says Gary Cohen, president of global health and development at BD. "If it succeeds, it will stimulate further confidence. If it does not, it will send a very bad, stifling signal."

Yet it may be at least three years more before the device makes it to market after clinical trials and regulatory approval. "If someone had told me it would take this long, I would have been surprised," says Odón.

His experience demonstrates the scope for simple innovations that could help to substantially reduce the unnecessarily high instances of maternal and child illness and death around the world. It also highlights the challenges involved in fostering, nurturing and delivering such innovations. Basic products including medical devices, medicines and diagnostics often already exist, but are not made widely available, including many of the low-cost generic medicines on the World Health Organisation's "essential medicines" list.

Vaccines, including for measles and yellow fever, have enormous potential to prevent infection and death. Yet even those that are available remain underused, as happened during the last pandemic flu outbreak. That is partly a question of cost, but also of governments' priorities and of capacity to procure, store, distribute and administer them.

While many health advocates focus their criticism on the high prices that pharmaceuticals charge for medical products — and the intellectual property they retain over them — less attention is paid to the need for more investment in technical aspects of healthcare systems: staffing, training and management.

Improving these aspects means holding governments to account. A recent analysis published in The Lancet, the

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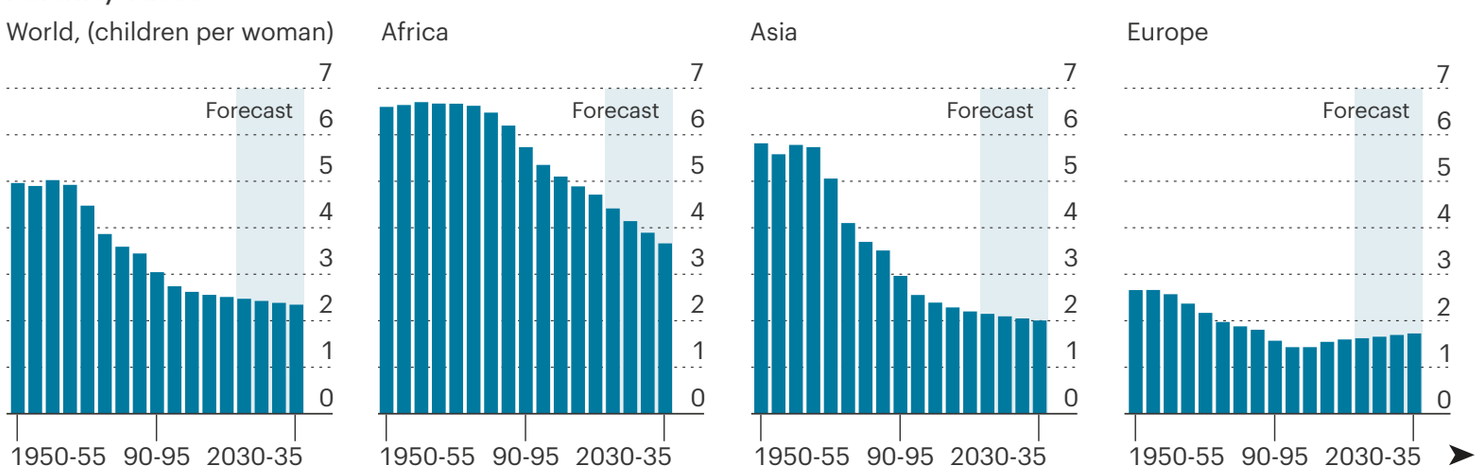
Fertility rates



PHOTOS: CHARLIE BIBBY; TOM PILSTON; KATE HOLT; SERENA DE SANCTIS

1. Seema Prajadat and her baby Aryan are practicing kangaroo mother care
2. Posters about family planning, pregnancy, childbirth and postnatal issues in Sierra Leone
3. Life in the migrant camp at Dunkirk
4. Chad has experienced an influx of refugees from neighbouring Niger and Nigeria

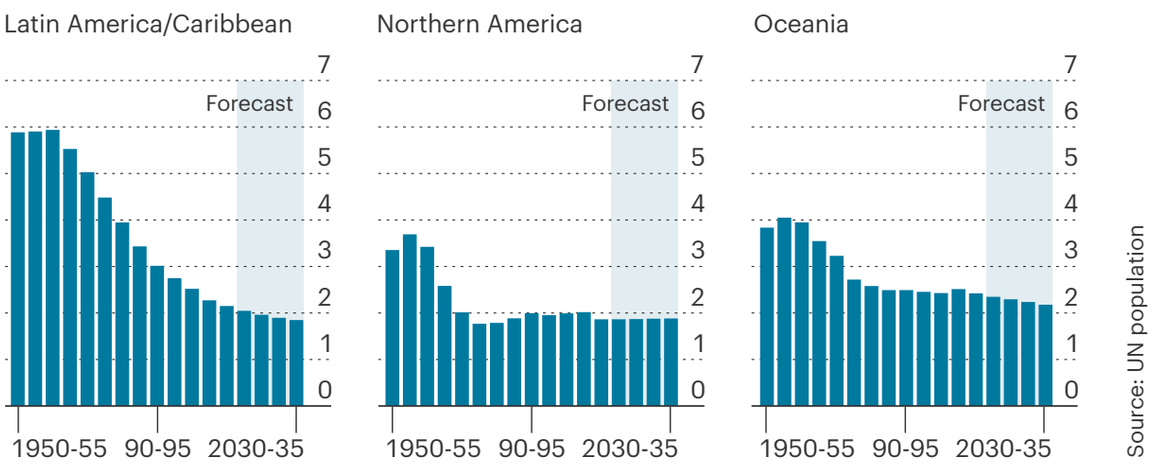
medical journal, estimated that 216 women per 100,000 live births died of maternal causes in 2015 — lower than in 2000, when the Millennium Development Goals were set, but far short of the target numbers set by the MDGs and their replacements, the Sustainable Development Goals.

Wider deployment of already available options could make a difference at relatively little cost. For example, the latest estimates suggest that 225m women and girls in developing countries — particularly the poorest and most vulnerable — still have an "unmet need" for modern contraceptives, meaning that they would use them if only they were available.

In turn, improved family planning would reduce the risk of unwanted pregnancies, allowing women to make sure they do not have children too young, too frequently or under circumstances that will impede their own paths to education and employment. Exclusive breastfeeding would do a lot to improve maternal and child health by providing a natural form of contraceptive to space out pregnancies and significantly improving infant nutrition. Medical checklists, popularised by the surgeon and writer Atul Gawande, can ensure procedures are consistent, such as for child birth and prenatal care.

This magazine focuses on the most serious problems facing women and children across the world today, as well as a number of potential solutions: El Salvador's extremely harsh abortion laws, which often see women imprisoned for aggravated murder; the plight of refugee children across Europe; Chad's stubbornly high fertility rates and China's efforts to wean itself off unnecessary caesarean births following the reversal of its one-child policy. It also highlights five examples of innovations that have already demonstrated impact and now need support — whether of funding, expertise or partnership. We invite readers who are interested in helping to sustain, replicate or scale up these projects to contact showcase@ft.com.

Alongside medical commodities such as Odón's device, these profiles describe simple approaches such as kangaroo mother care, originally developed in Colombia in the 1970s, but now making a difference around the world. Other innovations include the recruitment and training of community health workers to deliver door to door care in Uganda and subsidised health insurance programmes, such as a pioneering project in the



'Across Africa, there is a junkyard of equipment that is dumped when it goes wrong'

western state of Kwara, Nigeria. Its initial success has spurred debate about the introduction of a state-wide programme, allowing richer individuals to support the costs of premiums for the poor.

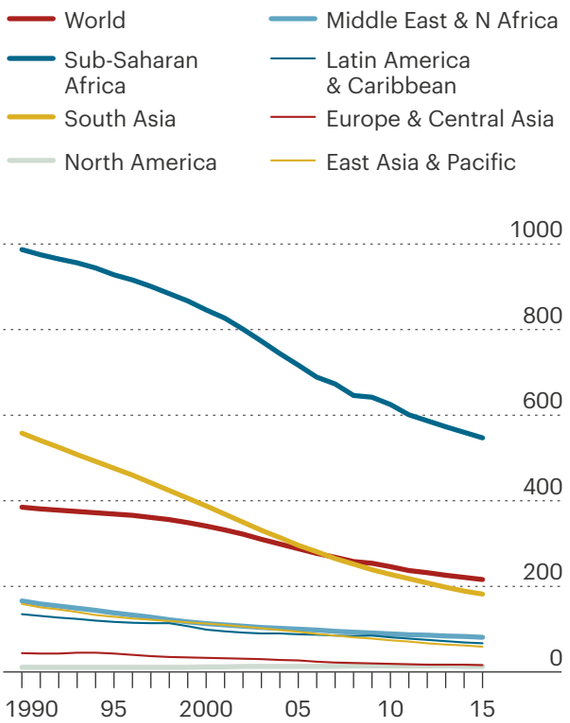
Kenya has introduced an ambitious multi-year contract that places the onus on manufacturers not only to supply medical equipment, but also to maintain it and train health workers in its use. "Across Africa, there is a junkyard of equipment that is dumped when it goes wrong," says Nicholas Muraguri, principal secretary at the country's ministry of health.

Previously, Kenya had just two intensive care units, and a handful of diagnostic and dialysis centres. Patients in remote areas were effectively condemned to die, he argues. The new multi-year contract with five multinational suppliers offers enhanced support across the nation.

But some innovations are condemned to fail because the technology involved is too sophisticated, or because their business model was never sustainable. A number of projects are only carrying on thanks to donors after several years of funding.

Maternal mortality ratio

Per 100,000 live births



Source: World Bank

Remote living
Until recently, Kenya had just a handful of diagnostic and dialysis centres

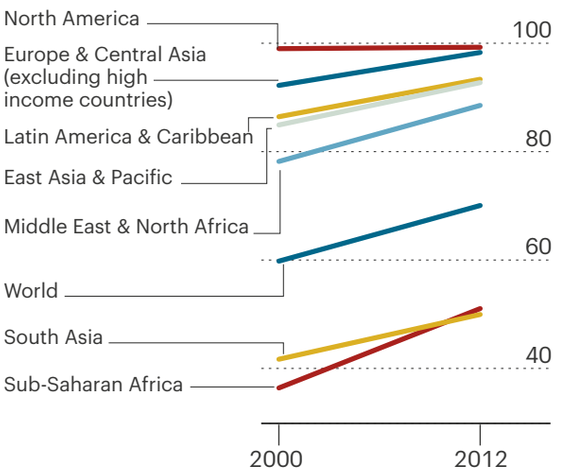
Mortality rates worldwide

216
maternal deaths per 100,000 live births

42.5
deaths of children under five per 1,000 live births

Births attended by skilled health staff

(% of total)



Source: World Bank

The trick is to find the right models and the right partners: whether for-profit and social investors, governments and philanthropic donors; or technical advice and expertise from consultants and companies. Ultimately, they should be effective enough to win the support of the public sector — whether for funding or co-existence.

Babatunde Osotimehin, executive director of the UN Population Fund and a former health minister in Nigeria, stresses the importance of ideas that can be integrated with government plans and that reflect their priorities. Otherwise, they will never be picked up, he says.

Tim Evans, senior director of health, nutrition and population at the World Bank, argues for the need to focus on innovations of significant size to ensure they can have impact and be sustainable. "Small showcase projects are too often unable to get to scale," he says. "Innovative financing and the ability to implement are essential for real impact."

Much of the innovation required to ease the ill health of mothers and children is to do with people, systems and funding. As Arnab Ghatak, a senior partner in global public health at McKinsey puts it: "We have a lot of the technology we need. It's really a question about delivery and engaging with governments." ●

‘These deaths are preventable’

During a conflict or a time of crisis, women and their babies are at their most vulnerable, says **Joanne Liu**

The provision of emergency care is vital even in times of great uncertainty

From London to Aleppo, pregnancy and childbirth are part of the normal cycle of life. Delivery is by far the most dangerous time for both a woman and her baby and the vast majority of maternal deaths occur just before, during or after delivery, often from complications that cannot be predicted.

The pre-existing risk of complications that all women face can quickly become a death sentence if skilled medical care is unavailable.

During a conflict or a time of crisis, women and their babies are at their most vulnerable. The five main causes of maternal death include haemorrhage, sepsis (infection), complications resulting from unsafe abortion, hypertensive disorders and obstructed labour.

Maternal mortality rates worldwide dropped by over 40 per cent between 1990 and 2015 but challenges clearly remain. In many countries where MSF works, obstetric care is in a constant state of emergency. National health systems are disrupted, there is a lack of qualified medical personnel and the necessary medicines and equipment are not available. Many women in these places are unable to access medical care due to insecurity or conflict, some are not permitted to go to hospital alone, or at all, while others cannot afford to seek out professional medical care.

Even before the 2010 earthquake struck Haiti, which severely damaged or destroyed 60 per cent of its health facilities, the country had extremely high maternal mortality rates. In the aftermath of the disaster, women arrived with pre-eclampsia or eclampsia — serious conditions characterised by high blood pressure, exacerbated by stress. With the construction of its Centre de Référence en Urgences Obstétricales in the capital, Port-au-Prince, MSF is responding to the city’s ongoing emergency obstetric care needs.

This has included caring for pregnant women with cholera. Obstetric cholera treatment units, supervised by specialised staff, handle the ensuing serious and sometimes life-threatening obstetric complications or premature labour. Offering 148 beds, these units assisted over 6,000 births in 2015.

The risks faced by women during pregnancy and childbirth are compounded when they are forced to flee their homes due to violence or instability. By the time they reach safety, these women are in a weakened state and the living conditions that greet them are precarious, further endangering the survival of both mother and baby.

When the Ebola epidemic ravaged West Africa, newborns entered a world where hospitals were shut, health staff were scarce and people were frightened. Fever and bleeding — both common during pregnancy — are also symptoms of Ebola, so health staff were often reluctant to admit pregnant women to hospitals or let them deliver in health facilities, fearing contamination.

When I was in Liberia in 2014, four pregnant women showed up at MSF’s Ebola treatment centre, having spent the whole day searching for a place to deliver. By the time they reached MSF, they had all lost their babies. Their plight underlined how vital the provision of emergency care is, even in times of great uncertainty. To address this, MSF set up a centre in Hastings, Sierra Leone, with specific obstetric services for Ebola-positive pregnant women in need of tailored care. Medical staff focused on trying to minimise the mother’s bleeding while in labour and after delivery, to prevent her dying from haemorrhage.

Approximately 830 women die every day from causes related to pregnancy and childbirth, according to the World Health Organisation. It is estimated that 99 per cent of maternal deaths happen in the developing world. These deaths are preventable. If complications are identified and addressed quickly, and care is available, the chance of survival is high.

MSF provides skilled birth attendance and emergency obstetric care in one third of all the organisation’s projects in 69 countries; over 200,000 deliveries in 2015 were assisted by MSF teams, who additionally offer preventive action such as contraception, prevention of mother-to-child HIV transmission, prenatal care as well as cervical cancer screening, treatment and the repair of obstetric fistula.

We must continue to be present and to provide skilled care to the women and girls who need it. ●

Joanne Liu is the international president of Médecins Sans Frontières

Europe's migrant mothers

Women and children crossing the continent are at particular risk of health problems without access to medical care

By **Adam Thomson** in Calais and Dunkirk
Photographs by **Charlie Bibby**


1.

Last November, Mamit stuffed four changes of clothes into a black leather handbag, grabbed her Bible and left her native Eritrea under cover of night, fearing persecution for her religious beliefs. Ten months later, in mid-September of this year, the 42-year-old mother of two sits on a roadside by the Jungle migrant camp in Calais, northern France. It is just a few weeks before the French authorities will begin to demolish the camp and resettle its inhabitants.

She is still clutching her Bible, which is now dog-eared and missing its cover. She is also much thinner: Mamit lost nearly a quarter of her body weight after long periods of hunger, dysentery and other illnesses during her journey from Africa. "I was a fat woman when I left home," she says, her hands tracing a balloon shape around her now-slender figure. "My family would never recognise me now."

More than a million men, women and children — economic migrants and refugees from war-torn countries — entered Europe by land and sea in 2015 alone. They continue to move into and across the EU, undeterred by the lack of access to medicine or doctors on the journey. Even when they reach Europe, the great majority continue to face health risks, particularly in places such as the heavily populated Jungle camp, which the French government began dismantling in October after years of inaction. ➤

2.

1.
Mamit with her Bible and the leather handbag she used to carry her clothes
2.
Yabsira's daughter, left, in the caravan she shared with her mother in the Calais Jungle

1.

'The EU authorities have preferred to turn their backs in the hope that the problem will just go away'

"The refugee challenge is first and foremost a humanitarian catastrophe," argues François Gemenne, a migration studies researcher at France's Sciences Po university and the University of Liège in Belgium. "They arrive in Europe having suffered psychological and physical damage only to realise that, in Europe, conditions are often worse."

Women such as Mamit, and especially those travelling with children, are often the most exposed to the physical and mental ravages of a journey that can take months, sometimes years. Reliable figures for migrant movements are difficult to pin down. But an asylum "pre-registration campaign" to collect data, launched in June by the Greek Asylum Service, showed that 44 per cent of the more than 20,000 people enrolled were female. Of those women, almost one in five was travelling with children, and about one in six was pregnant or had recently given birth, implying far greater health risks for women than for men.

Yabsira, a 28-year-old mother of a five-year-old girl, says she had no idea of the horrors her journey would entail before she fled Sudan along with her then four-year-old daughter. An Eritrean by birth, Yabsira had been living in Sudan with her mother, husband and daughter, and working as a maid, having escaped violence at home years before. After her husband was arrested and subsequently disappeared, Yabsira decided Sudan was no longer safe.

"We left in a big lorry," she recalls of the 10-day leg to Libya, the first part of a three-month struggle to get to Calais. "There was almost no food or water, so the little they gave us I gave to my daughter."

In the lorry, Yabsira slept with her daughter curled up in her lap for lack of space. They suffered diarrhoea and vomiting repeatedly on the journey, and had no access to any form of healthcare. Two of their fellow passengers died — one fell out of the lorry, the other from dysentery.

1. Yabsira with her daughter in Calais
2. An Iraqi-Kurdish family prepares dinner in the Grande-Synthe camp
3. Sidra's daughter Renas in Grande-Synthe

2.

In the Calais camp, where she had been for five months, Yabsira and her daughter were living a precarious existence. They tried to get to their final destination of the UK many times, but she says it proved almost impossible to jump on to a lorry with a child in tow. In the meantime, they sheltered in a cramped caravan in the Eritrean section of the approximately 9,000-strong camp. About 1,000 of the camp's inhabitants were estimated to be unaccompanied minors, the most vulnerable of whom were being allowed entry to the UK at the time of the camp's destruction.

Yabsira says a doctor in the camp gave her a spray to treat a rash that broke out on her arms and legs. She has also received a bottle of syrup for treating the colds, sore throats and temperatures that her daughter has suffered since arriving at the camp. It is the first medical attention the two have received since setting out from Sudan.

Until recently, what healthcare there was at the camp was thanks not to the French state but to Médecins Sans Frontières (MSF), the humanitarian aid organisation, and to other non-governmental organisations, such as Médecins du Monde. Many experts argue that the lack of official attention given to refugees' health provision across Europe is indicative of EU authorities' unwillingness to acknowledge a problem that shows no signs of disappearing. "They have preferred to turn their backs in the hope that the problem will just go away," says Gemenne. "It's just a crisis management mindset."

At the EU level, some kind of response is finally taking place, argues Jean-Pierre Schembri, a spokesman for the European Asylum Support Office (Easo), an EU agency set up to facilitate and co-ordinate practical co-operation between member states on aspects of asylum, including how to provide healthcare. "Easo is deploying vulnerability experts in the Greek hotspots in order to identify and refer applicants with special needs, including applicants with health issues," he says.

The agency, which has no specific mandate on health issues, has nonetheless developed guidelines for member states, setting standards for reception conditions of migrants, including access to healthcare. The guidelines were only adopted by Easo's management board this September and their publication is still pending.

Meanwhile, Gemenne says individual countries continue to undermine EU-wide efforts to co-ordinate a more comprehensive response to migrants who arrive at their borders. "Proposals put forward by Brussels to improve conditions and harmonise asylum regimes across Europe have been systematically rejected by governments, for fear of losing sovereignty," he says.

An MSF study conducted at the end of 2015, of more than 400 people living in the Calais camp, shows that health problems are a constant theme of many journeys, in particular for women with children, who tend to be

3.

more vulnerable to sickness because of the physical demands of the journey, as well as the fact that travelling with children can make the going slower.

The study found, for instance, that almost two-thirds of respondents suffered at least one health problem during their journey, with acute respiratory infections by far the most common illness. It concluded that accessing healthcare is the hardest in Libya, where people wanting to enter Europe are held for weeks at a time as they wait for passage across the Mediterranean to Italy.

Mamit, who left her two children behind in Eritrea because she could not afford the fee the smugglers were demanding, says her time in Libya was the most difficult of the entire journey. "I waited for two months in a big hangar in that country," she says. "There must have been 600 of us in there. There was no room and the only thing they gave us was pasta, day after day."

During the wait for the boat to Italy, she fell ill with severe stomach cramps. "I asked for a doctor because the pain was so great, but I was just told there wasn't one," she says. "I spent two days like that; I thought at one point I wasn't going to get better."

For migrants who take other routes, things are little better. Sidra was four months pregnant and still suffering acute morning sickness when she set out with her husband and their two young children from her native Iraqi Kurdistan for the UK. She says that travelling with her eight-year-old son and seven-year-old daughter was a constant worry. "You have to look after them much more because they get so tired," she explains. "You also live in fear of losing them because there are so many other people."

The worst moment was their sea crossing from Turkey to Greece, an early stage of a commonly taken route that involves many days of trying to avoid police and border patrol units at multiple international frontiers, including Albania, Macedonia, Serbia and Hungary. "We spent days on the boat without food or water," she says. "My children were so frightened and so was I. I thought I was going to die."

Now her family is housed in a small wooden shelter at a migrant camp set up by MSF last year in Grande-Synthe, a suburb of Dunkirk, 40km east of Calais. It is tempting to think that they are over the worst. The last rays of sunlight are starting to fade, and Renas, Sidra's seven-year-old daughter, is dressed in a pair of Mickey Mouse pyjamas and playing with other children, while a group of older girls sit on stools plaiting each others' hair.

Several Kurdish families staying at the camp have come together for the evening to share donated meat and rice, which the women are busy preparing over small wood fires. Washing dries on two long clothes lines and Sidra tells her children to pick up some half-broken toys they have left in the dirt.

Grande-Synthe houses about 2,500 people, most of them Kurds — and mostly families with small children. There are some rudimentary health facilities at the camp, thanks to a modest medical centre established by MSF at the start of the year which is now run by Utopia 56, a volunteer-based organisation, and local health authorities.

Since February, MSF has carried out at least two vaccination campaigns for 2,000 adults at Calais and 500 at Grande-Synthe. They also vaccinated about 250 children aged under six — 200 in Grande-Synthe and 50 in Calais — against tuberculosis, polio, tetanus, and gave them the triple MMR vaccine. But in spite of that, families staying at Grande-Synthe still say that they suffer continual health problems, ranging from persistent respiratory illnesses and stomach infections to rashes and sores.

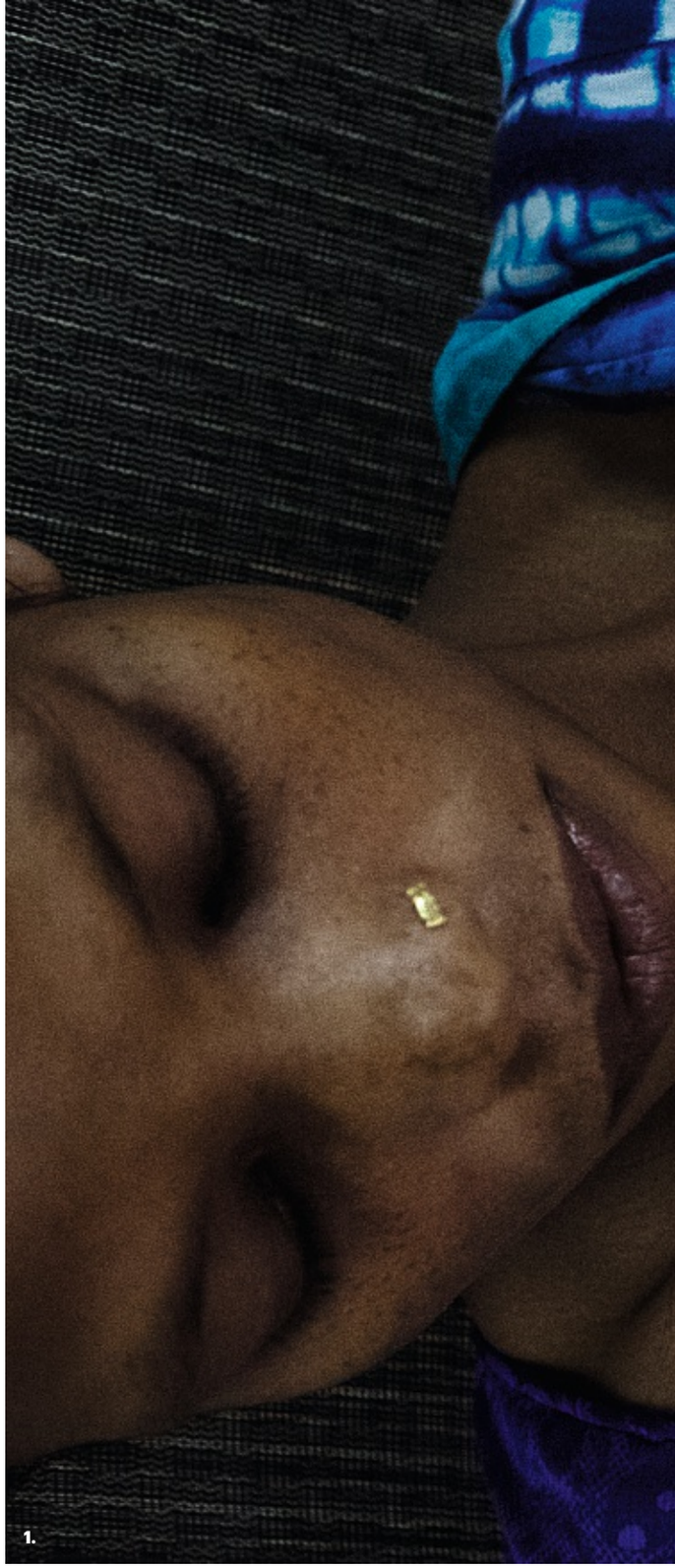
Sidra and her family have been in the camp for 45 days. They have tried to smuggle themselves into the UK three times, each time leaving everything behind except for their sleeping bags. But she says that sneaking into a lorry at night with two small children is just too difficult. Now that Sidra is six months pregnant, and wondering how she will get to her final destination, doubts are starting to creep in about where her next child will be born. "I still hope that it will be England," she says. "But I'm no longer as sure as before."

In Calais, as the makeshift structures of the Jungle camp are taken down, the future for Mamit, Yabsira and her daughter, is a blank. ●

Up close and personal

A project where mothers coach other women to breastfeed early and hold their babies skin to skin aims to reduce neonatal deaths

By **Amy Kazmin** in Uttar Pradesh
Photographs by **Serena De Sanctis**



1.

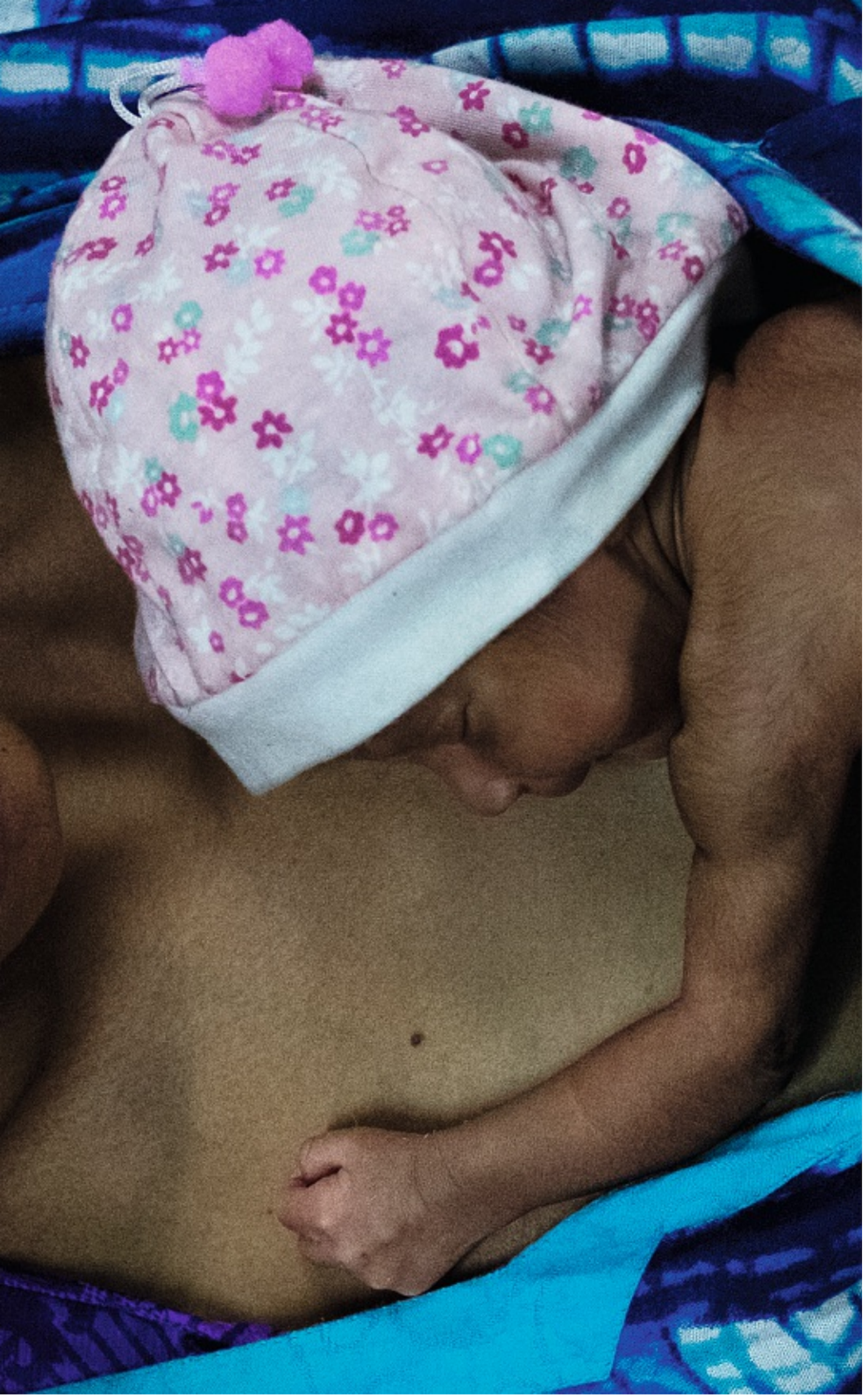
When Sushma Sahu gave birth to her first son six years ago in a village in Uttar Pradesh, India's most populous state, her mother-in-law asked the local Hindu priest to recommend an auspicious time to start breastfeeding the baby. The priest set a time on the infant's third day of life. In the meantime, the newborn would be fed with honey and water then cow's milk. "My first time, I didn't know anything," says Sahu. "I trusted my mother-in-law and whatever she was saying."

But three years later when Sahu gave birth to her second child, a daughter, the nurse in the primary health care centre told her to start breastfeeding immediately, as recommended by the World Health Organisation to ensure newborns get their mother's first milk (known as colostrum). Colostrum is rich in protective antibodies, vitamin A and proteins, and is only produced in the first few days after childbirth. Sahu did as the nurse suggested. "I also felt like breastfeeding, so when the nurse told me, I didn't really wait for anybody," she says.

Now Sahu is one of a small group of Indian mothers who are trying to persuade others to breastfeed their newborns straight after birth and to provide skin-to-skin contact to help keep them warm. The women are part of a year-old experiment aimed at reducing Uttar Pradesh's persistently high rates of infant mortality.

The project, led by the Community Empowerment Lab, a research organisation, has involved mothers like Sahu being trained as "life coaches" and then paid to advise women during their pregnancies and in the first month after their babies are born. The aim is to entice women to change their pre- and post-partum practices — including adopting early breastfeeding and skin-to-skin contact, which together are known as "kangaroo mother care" — and measurably cut newborn deaths.

"People don't need messages, they don't need information — they need a friend they can trust," says Vishwajeet Kumar, founder of the Community Empowerment Lab. "If you go and tell them something, it doesn't change anything. You need to work with them.



1.
A mother and baby in the kangaroo care unit at Veerangana Avanti Bai women's hospital in Lucknow, Uttar Pradesh
2.
Annapoorna Verma, a life coach

There is no shortcut to these things — you need to navigate, negotiate. You need to nudge."

Public health professionals believe simple practices such as kangaroo mother care could help reduce India's high infant mortality rate: 700,000 newborns die within a month every year. In the state of Uttar Pradesh alone, 240,000 newborns die each year — about the same number of deaths as were caused by the 2004 Indian Ocean tsunami.

Kangaroo mother care was originally developed in Colombia nearly four decades ago, when doctors in an overcrowded, poorly equipped hospital found the practice could help save premature or low-birthweight babies who might otherwise have been put in incubators — had these been available.

In 2003 and 2004, impressed by the success of these simple techniques, Dr Kumar and his colleagues carried out a study to see whether they could be used to reduce infant mortality in rural Uttar Pradesh, where most women were having their babies at home, loyal to traditional practices for the care and handling of newborns.

The results were clear: the study showed that infant mortality in Indian villages could be reduced by 54 per cent if new mothers adopted early breastfeeding and held their babies close for long periods of time. The impact was especially significant for premature or low-birthweight babies, who are at the greatest risk. "This is the most powerful intervention we know of," Dr Kumar says.

Gary Darmstadt, associate dean for maternal and child health at Stanford University School of Medicine in the US, acknowledges the global benefits: "A lot of great evidence has been gathered on the impact of kangaroo care on preterm, low-birthweight babies. The mortality reduction in that population is 40-50 per cent," he says.

But despite the weight of such evidence, Indian public health experts have struggled to figure out how to persuade more rural women to adopt techniques that are at odds with traditional methods of babycare, as well as the demands of rural life, where daughters-in-law are expected to do much of the heavy work for large extended families, including preparing food, tending to livestock and crops, and fetching water.

"If you want to be able to provide this care to the baby, you have to think about the broader elements of the system you are trying to make that happen in," says Dr Darmstadt. "If the system is not supportive of the practice, it's very difficult for the mother to provide that care."

Nearly 70 per cent of Indian babies are now born in some form of health centre — a dramatic shift from a decade ago, when most babies were born at home. ➤

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1.
A village in Shivgarh district in Uttar Pradesh

2.
Akhteri Bano with her baby during her first postnatal visit from life coach Annapoorna Verma

Nurses in India's overstretched and understaffed primary healthcare centres might briefly advise women, but they have little capacity for sustained intervention, or to override the wishes of powerful mothers-in-law attached to old ideas. Many women are sent home from clinics — or simply leave — within an hour or two of giving birth, often before breastfeeding their babies.

Traditional newborn care practices are rooted in Hindu notions of ritual purity and impurity, which affect how both mothers and babies are treated immediately after birth. In Hindu societies, a woman's menstrual blood is considered impure, as are the blood and fluids associated with childbirth.

In Uttar Pradesh, new mothers are kept in confinement for up to 40 days after childbirth and newborns are vigorously scrubbed — sometimes in cold mud — to purify them, which can lead to hypothermia. Colostrum is traditionally seen as dirty and harmful for the baby. As of 2014, fewer than a quarter of newborns in Uttar Pradesh were breastfed within an hour of birth.

Dr Kumar's idea — now being tested in a small-scale pilot study — is to see whether his "life coaches" can change these practices. The coaches, all mothers themselves, and mostly college graduates, make pre- and postnatal visits to prepare mothers-to-be for birth and its aftermath, to try to inspire the women and their families to adopt new practices.

"We try to identify women in the village that [mothers] can look up to," says Dr Kumar. Each coach in the pilot study has been responsible for 600 families. They try to engage with every pregnant woman in their area, making a series of three prenatal visits followed by three visits in the month after the birth, including on the day the baby is born. Currently there are only 10 coaches, but the preliminary results — measured against a control group in an area with no intervention — are encouraging. The initiative will soon be scaled up to 100 or 150 coaches, Dr Kumar says.

In their meetings with pregnant women, the coaches share videos on a tablet device and describe their own experiences of childbirth and caring for their babies. In each household, they determine which family members will dictate newborn care practices and try to find out how new babies have been cared for in the recent past. "They try to figure out who is making decisions and get some sense of what family [childcare] practices are," says Aarti Kumar, the co-founder of the group.

In September, Annapoorna Verma, a 30-year-old coach, called on Akhteri Bhano, who was already back at home in her village of Bhaunsi, hours after giving birth to her third child at the community health care centre in Shivgarh 12km away. Verma weighed both mother and baby and took their temperatures. She then showed Bhano how to hold the baby skin-to-skin to keep him warm in the dark, damp interior room where Bhano was to spend at least a week recovering.

In a nearby village, Sahu was calling on Rukhsana Khatoon, 22, who was in her second trimester. After weighing her and taking her blood pressure, Sahu talked with the young woman and her husband about foetal development. She explained to the couple that Khatoon should eat nutritious, high-protein foods such as eggs, milk and vegetables to help the baby grow.

On her next visit, she says, the talk will turn to postnatal care. Khatoon's mother-in-law, Islamunisa, says the newborns in their family are traditionally given water and honey and goat's milk for a few days before breastfeeding begins — villagers believe milk will not arrive until several days after the birth. They also throw the colostrum away in a ritual where it is cast on the ground as an offering to the earth.

"It's a tradition," says Islamunisa. "We don't know why we do it." But it is a tradition that Sahu will try to change rather than preserve. ●

Mortality rates in India

556

maternal deaths per 100,000 live births

48

deaths of children under five per 1,000 live births

Skin to skin

In Cameroon kangaroo mother care is being promoted as a cheap and effective way to care for newborns. By **Andrew Jack**

The project
The Cameroon government, in conjunction with the Kangaroo Foundation, Grand Challenges Canada (a Canadian government-funded innovation fund), Social Finance (a UK non-profit) and the World Bank's Global Financing Facility, is developing a performance-based financial bond to expand the use of a cheap and effective way to care for premature babies across the country.

The need
Around 18m children each year are born prematurely or underweight, which is the cause of three-quarters of neonatal deaths. These babies also have a higher risk of infection, long-term health problems and abandonment by their mothers. Existing techniques such as incubators are often too costly or impractical to be used in poor regions, without local staff or support.

How it works
Kangaroo mother care, first devised in Colombia in 1978, is a low-tech approach that uses constant skin-to-skin care between mothers with their children, exclusive breastfeeding and early discharge from hospital with close follow-up. A financial bond, set to launch in 2017, will raise up to $9m to implement "training the trainers" for its use in up to five regions in Cameroon. Investors will be reimbursed, and will potentially receive a bonus, if targets are met.

The impact
Kangaroo care has been shown repeatedly in rigorous studies to reduce infection and infant abandonment, and to improve survival and maternal attachment to babies. A pilot study in Douala, Cameroon, that began last year showed that kangaroo care reduced neonatal mortality from 43 per cent to 28 per cent. Other social impact bonds have demonstrated the potential to raise money and link reimbursement to improved outcomes.

What is needed next?
- Investors for the bond, both those seeking social and financial returns.
- Donors to cover costs and bonuses.
- Evaluation partners to develop and study outcomes, including access to care, impact on mortality and morbidity.
- For the Cameroon government over time to draw the lessons and itself tailor and fund kangaroo care across the country.
- Support to integrate care with other services.

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Second time around

The end of the one-child policy has prompted an official effort to dissuade women from taking on the risk of C-sections

By **Lucy Hornby** in Yichang
Photographs by **Giulia Marchi**

In the fog-wrapped city of Yichang on the Yangtze in the shadow of the world's largest hydroelectric dam, Wan Xindi is triumphant as she cares for her new baby daughter. Her second child is healthy and cute, but Wan is most proud of how she came into the world: the old-fashioned way.

A natural birth is in itself an accomplishment in China, where caesarean section rates were, until a few years ago, the highest in the world. Wan was one of the many Chinese women who underwent a medically unnecessary C-section when her first baby arrived. During her second pregnancy, the 25-year-old went to every hospital in Yichang, determined to find a doctor willing to allow her to attempt a vaginal delivery. In the process, she became a foot soldier in the battle to wean China off its addiction to C-sections.

"We think of ourselves as tunnel fighters or guerrillas. We find all kinds of ways to make it happen," she says. Her weapon of choice: the smartphone.

China's decision in 2013 to allow most couples to have two children has involved undoing social practices entrenched over 35 years of the one-child policy. One ➤

Safely delivered
Wan Xindi back at her home in Yichang with her newborn daughter Xiaozuo

'I learnt so much in these online classes, I feel I should share it. Some mothers don't research much'

of those is the preference for C-sections that are not needed for any medical reason.

All else being equal, C-sections involve a slightly higher risk to the mother than natural births. They also increase the possibility of life-threatening complications in future pregnancies, including rupture of the uterus or abnormal attachment of the placenta. These risks become a national problem when nearly half of women approaching their second labour have had a C-section during their first.

In the first half of this year already, the number of maternal deaths has climbed by nearly one-third compared with last year. "This is due to the second-child policy," says Mao Qun'an, a spokesman for the National Health and Family Planning Commission. "We are promoting the idea that women need to consider that if they choose C-sections for their first birth it could affect their second pregnancy."

"It's very dangerous," says Pang Ruyan, vice-president of the Chinese Maternal and Child Health Association, which argues against C-sections in the Chinese system and advocates a greater role for midwives to assist with natural births. "The only reason the rate of C-sections is so high is because people expected to only have one child. They didn't need to think about having another, or the risk of ruptures."

The World Health Organisation puts the optimal C-section rate for the health of mothers and babies at between 10 and 15 per cent. In the US, with its lawsuit-prone system geared towards medical intervention, the rate is 33 per cent. In the UK, it is 24 per cent. In China, the rate had reached 46 per cent by 2008 before health officials realised the extent of the problem. Some urban hospitals delivered more than 70 per cent of babies by C-section until the government began to stem the practice about four years ago.

As China prepares for an increase in second births, the health system is moving away from C-sections. In the spirit of the planned economy, public hospitals have been given C-section quotas. Doctors — some of whom have never attended at a vaginal delivery — are being given crash courses in natural birth or are being retrained in surgical techniques to reduce the risks in future pregnancies.

China's official C-section rate has dropped to 35 per cent, and the health ministry has embarked on an unusual attempt to change public perceptions in favour of natural birth. Efforts to re-educate Chinese mothers range from online classes and smartphone information apps featuring healthy pink infants, to gory videos of C-sections that go viral on Mother's Day.

The second front in the battle to wean China off C-sections is being led by women like Wan. Some mothers like her who have already had a C-section have decided to attempt vaginal delivery the second time around (known as a "vaginal birth after caesarean", or VBAC). This option carries its own risks: the first scar can rupture during the birth.

1.

2.

Their inspiration and support come from a stocky professional midwife in her 50s named Zhang Hongyu, an agony aunt for women in China hoping to take control of how their babies are born. From her home in the southern island province of Hainan, Dr Zhang maintains smartphone apps that extol the benefits of natural birth. She hosts forums — online and on the ubiquitous Chinese social-networking app WeChat — that buzz with discussions between hundreds of expectant mothers. Some women text for help and advice straight from the delivery room. "A lot of people are not very clear about this natural process," Dr Zhang says.

In the chatrooms, converted mothers like Wan jump in to answer the concerns of novices to natural birth. "I learnt so much in all these online classes, I feel I should share it. Some of the mothers, they don't bother to research much," she says.

Wan's own quest for a VBAC was followed avidly by the group. "I'm not going to live-stream," she told her followers the day she checked into the hospital. She

1.
Wan with Xiaozuo and her son Pan Youhe, aged two
2.
Wan while pregnant with Xiaozuo
3.
The compound where Wan lives in Yichang

nonetheless proceeded to text updates. "The pain is bearable," read one. "They were all waiting to see if I could do it. I've inspired a lot of them," she says.

Why do so many Chinese women choose C-sections? Doctors blame the families. New parents and, critically, grandparents, will do anything to make sure their one baby is perfect, including selecting the right day and even hour for an auspicious birth. Older people believe that young women brought up as single children are too pampered to bear pain. For years, C-sections have been marketed as high-tech and pain-free, with no mention of discomfort after the operation or the risk to future pregnancies.

"When people only have one child they are overly worried," says Dr Zhang. "They are worried about loss of oxygen; they want to hurry up and get it out and have their healthy baby. Plus they think surgery is simple and fast."

Women like Wan argue that not-so-subtle pressures from doctors scare women (or their husbands and in-laws) into asking for medically unnecessary C-sections. "The doctors always tell you the worst-case scenarios. First-time mothers always listen to the doctors," she says. "Second-time mothers are much more confident." ➤

With wealth comes improved health

China has achieved notable success in the past 15 years in improving maternal health and bringing down its child mortality rates — two of the eight Millennium Development Goals that the UN established in 2000. Its high population means such gains in China translate into survival for hundreds of thousands of women and children.

That success is partly a result of the country's rapid increase in wealth, which has led to improvements in nutrition for pregnant women and babies. The state has also been able to invest more in medical care, including prenatal check-ups and neonatal intensive care units.

"Before, some babies were simply not treated because of family poverty. But now fewer and fewer are left untreated, because parents have health insurance and the state has more resources," says Dr Liu Cuiqing, head of the neonatal unit at Hebei Provincial Children's hospital in Shijiazhuang. "But that puts more pressure on us, given the shortage of doctors, because to treat babies with serious conditions requires more work, more equipment and more time."

There are also darker explanations behind the shining improvements in the statistics. China's rigid population control policies — which have been eased over the past three years to allow almost all couples to have a second child — have meant that most families would abort at any sign of irregularity in prenatal scans, to avoid a possible health problem in their only child.

Some doctors and parents admit privately that stillborn babies, or newborns with untreatable conditions, are sometimes handed to their parents unregistered so that hospitals do not miss their targets for reducing infant mortality. **Lucy Hornby**

'The only reason the rate of C-sections is so high is because people expected to only have one child'

For overcrowded urban hospitals, the financial incentives are clear. In Yichang, a natural birth costs about Rmb3,000 ($450) and requires a nurse or midwife's attention for several hours. A C-section costs up to Rmb11,000 and only takes up about 30 minutes of the doctor's time, providing a much more attractive revenue stream. Surgeries also yield a larger *hongbao* (a gift packet) from grateful families. Unscrupulous doctors can pad out revenues further by making quicker (but harder to heal) vertical incisions, charging per suture to close the wound or adding extra fees to remove gauze or stitches.

In the 1980s, hospital births were the privilege of China's urban citizens. Women in rural areas had their babies at home and went to hospital for abortions or sterilisations after out-of-plan pregnancies. But by the 2000s, as migration to cities accelerated, the vast majority of Chinese women gave birth in hospital. It is no coincidence C-section rates rose steeply at the same time.

The relaxation of the one-child policy has revealed a disturbing downside to entrusting the future of the nation to the knives of surgeons in a hurry. Unofficial statistics for Beijing show a rate of complications in pregnancies after C-sections of about 10 per cent.

"Families, mothers, doctors all need to think differently," says Dr Pang, who co-authored the 2008 study in The Lancet medical journal that detailed, for the first time, the extent of China's C-section problem. With the protection of a long career at the WHO — and the blessing of the health ministry — she released it to the state television broadcaster, triggering a national discussion of the problem.

New public messaging in favour of natural birth has found a receptive audience at Beijing's main maternity hospital, where up to 1,500 babies are born each month. Heavily pregnant women stream through the doors. One day in May, every expectant mother who stopped for a chat agreed she would prefer a natural birth — a switch in attitudes from just a few years ago.

But altering public opinion is one thing; changing hospital procedure is another. In China, as in the US, institutional factors such as doctors' pay structure and hospital protocols keep C-section rates high.

In bigger cities, epidurals, known in Chinese as "no pain" births, now rival C-sections in popularity (and revenue potential). Dr Pang believes this is simply trading one interventionist approach for another: "Conditions are different here. We don't have enough anaesthesiologists." For that matter, she thinks VBACs are also too risky to be carried out widely in China, given the need for quick surgery and ample blood supply if labour goes wrong.

In hospitals in rural areas, where most families cannot afford C-sections, women are encouraged to walk around during labour and eat or drink for strength and hydration in line with traditional practice. Many urban hospitals forbid that. "The hospital has me lying on my back and won't let me move!" one expectant mother told Dr Zhang's group. Twelve hours later, denied food or water, "I ran out of energy and went for the C-section", she texted.

Women who have not used the smartphone information apps only receive vague guidance at hospital birth classes. The focus is on maternal nutrition until the eighth month, when mothers-to-be are given a cursory explanation of what to expect during the birth. "Open classes are like a big rice bowl or a cafeteria — they aren't tailored to personal needs," Dr Zhang says.

As China's health system reverses the trends that tipped the scales towards unnecessary C-sections, advocacy by determined mothers like Wan could help make reforms stick. "You have to inform yourself," she says. "If the doctors see that you know what you are talking about, they respect you and give you the information you need." ●

Additional reporting by Luna Lin

1. Wan looks after Xiaozuo while her mother Tan Guangchun plays with Youhe

2. Wan texts her chat group

Mortality rates in China

27

maternal deaths per 100,000 live births

11

deaths of children under five per 1,000 live births

2.

In the US, 'C' stands for convenience

Caesarean sections are among the most frequently performed operations in the US. As the rate plateaus from its peak of 32.9 per cent of births in 2009, medical researchers and health practitioners are working to reduce the number of surgical deliveries.

One movement is trying to change the guidelines that define how childbirth is handled for low-risk patients. "We know women who are admitted in early labour are more likely to have a caesarean and routine interventions, even if not clinically necessary," says Holly Smith, a nurse practitioner and co-author of new guidelines from the California Maternal Quality Care Collaborative (CMQCC) aimed at reducing this form of surgical delivery.

Delaying labour is one of several suggested tactics to reduce caesareans. "There is a little bit of denial that [caesarean delivery] is major surgery and that it poses a lot of problems," says Carol Sakala of the National Partnership for Women & Families. Along with the CMQCC and other maternity care groups in the country she wants to improve the quality of care for mothers and newborn.

The rate of caesarean births in the US has ticked up steadily since the late 1990s. Of particular concern to many medical professionals is the "overuse" of the procedure among patients who might otherwise be suited to a vaginal birth. There are several life-saving reasons why doctors in the US turn to caesareans — for example, if a baby is poorly positioned or if the baby's heart rate changes. The reasons on the part of the mother range from conditions such as diabetes or obesity to complications with the placenta.

In 2014, the American Congress of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine issued a joint report raising concerns over the increase in the number of caesarean births without evidence of improved mortality rates. While factors such as a rising maternal age might explain the increase, many believe the relative efficiency that caesarean deliveries allow is responsible. Doctors can plan for a much shorter delivery than through natural labour. Some research indicates obstetricians opt to perform caesareans to help prevent malpractice suits for serious birth injuries.

But caesarean deliveries carry the risk of complications, such as infection, of major surgery, along with longer recovery times than most vaginal births. Newborns delivered by caesarean are at risk of impaired respiratory function. Caesarean deliveries in the US are also some 50 per cent more expensive than vaginal births.

"It's much more convenient to say, 'Well, you know, it's getting to be my dinner time and my family time. Labour is not progressing very fast. I'll just do the caesarean now'," says Sakala. Vaginal birth, in contrast, "requires a lot more patience and resources and inconvenience on the system". **Aimee Keane**

Lives under strain

As evidence grows of a link between Zika and birth defects, poorer communities are particularly vulnerable. By **Samantha Pearson** in Recife

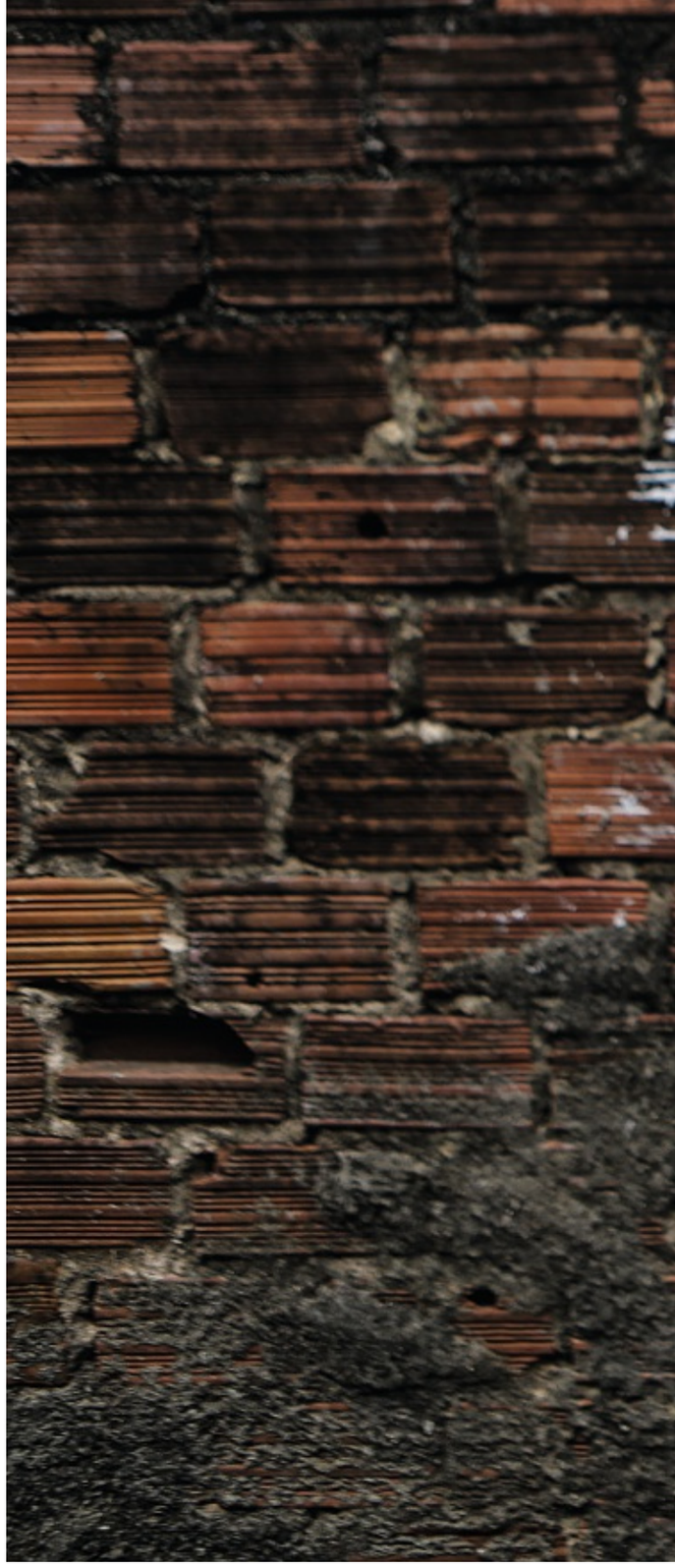


PHOTO: NURPHOTO/GETTY IMAGES

On November 12 2015, at a hospital in Brazil's north-eastern city of Recife, Maria Eduarda was about to be born. Her mother lived on the street and wanted nothing to do with the baby — she had already had seven children and had abandoned them all. Her father was an alcoholic and incapable of looking after himself, but he had a sister, Miriam, who had agreed to care for the child.

Miriam Pereira and her 18-year-old daughter-in-law, Cleane Stefani, were at the hospital, waiting to collect the little girl. They had already settled on the name.

It was not until after Maria Eduarda had been delivered that Stefani and Pereira realised just how difficult her life — and theirs — would become. Doctors measured the circumference of her head. At 26cm it was about 6cm less than the minimum for a healthy child, signalling a severe case of the birth defect microcephaly.

"We have no idea if she'll ever walk or even talk," says Stefani, as she cradles the 11-month-old baby in her arms in the family's cramped, makeshift home in a favela by a highway in Olinda, on the outskirts of Recife. The two women do have an idea of what caused the birth defect, however: Maria Eduarda's mother caught the mosquito-borne Zika virus about three months into her pregnancy, according to Stefani.

As well as needing a tube to ingest liquids, Maria Eduarda has difficulty breathing and moving, and has several seizures a day. She is one of an estimated 2,000 babies in Brazil born over the past year with microcephaly — a congenital condition where the baby's brain does not develop correctly during gestation, leading to an abnormally small head. Mounting evidence over recent months has shown that the Zika virus is at least partly responsible for nearly all of the recent cases of what is otherwise a rare condition.

While researchers develop a vaccine against the virus, which is not expected to become widely available in Brazil for another couple of years, scientists are struggling to understand Zika's mysterious effects. Infections have been reported in 72 countries since 2007,

Daily challenges
Cleane Stefani with Maria Eduarda, whose mother caught the Zika virus during pregnancy

according to the World Health Organisation, yet the number of cases of microcephaly linked to the disease has been much higher in Brazil than in other Zika-hit countries such as neighbouring Colombia.

While researchers are investigating factors other than Zika that may be behind the sharp rise in microcephaly in Brazil, they are also looking into other possible effects of Zika on pregnant mothers and babies. Tânia Saad, a neurologist at the Fernandes Figueira National Institute for the Health of Women, Children and Adolescents in Rio de Janeiro, says the children of mothers infected with Zika who did not develop microcephaly have nevertheless shown some degree of neurological damage."Often they show signs of being hyperexcited, with some difficulty or lack of co-ordination when it comes to breastfeeding or feeding themselves," she says.

Health workers now fear a possible second surge of microcephaly in southern cities such as São Paulo over the coming hot summer months. While researchers believe many women in Brazil's north-east will already have been infected with Zika by now, thus gaining immunity to the virus, São Paulo's expectant mothers may be more vulnerable, having not been exposed to the disease before falling pregnant.

"The trend is that the biggest outbreaks will occur ➤

'We need to be quicker and better at researching lesser-known infectious agents before they cause epidemics'

in states where there have so far only been a few cases," says Pedro Vasconcelos, director of the Evandro Chagas public health institute in the northern state of Pará. "Meanwhile, in those states that have already been badly affected, there are likely to be [no new] Zika infections or only a small number of cases."

Such forecasts are little comfort to Stefani and Pereira, or to the thousands of families having to care for a child with microcephaly. Stefani, who dropped out of school when Maria Eduarda was born, looks after the baby during the day, while Pereira, who has had to quit her cleaning job, takes the "night shift", she explains.

Almost every day, the women have to catch two buses to attend seemingly endless hospital appointments in Recife, often returning late at night, they say. Apart from a small government disability allowance, Stefani and Pereira rely on the money that Stefani's husband — Pereira's son — earns fitting car radios.

The biggest expense is lactose-free milk powder, Stefani says, pointing to a tin that costs R$120 ($38), equivalent to about 15 per cent of the monthly minimum wage. Maria Eduarda needs a couple of tins a week, Stefani says. "The government is meant to give that to us for free, but for the past three months they haven't had any available," she explains over the noise of a popular soap opera blaring from the television in the living room.

Zika has had a devastating effect on Brazil's poorer communities. The mosquitos that transmit the virus thrive in the stagnant water abundant in favelas such as the one where Stefani and Pereira live, which lack adequate plumbing and sanitation. The outbreak has also come just as unemployment is surging during Brazil's recession and government health budgets are under tremendous strain.

1.

2.

1. Cleane Stefani, left, at home with Maria Eduarda and Miriam Pereira
2. Mothers hold their infants, all born with microcephaly, after visiting a rehabilitation clinic in Recife

Mortality rates in Brazil

44
maternal deaths per 100,000 live births

16
deaths of children under five per 1,000 live births

Similarly, the Ebola outbreak that began at the end of 2013 also hit Africa's poorest communities the hardest. Megan Lees-McCowan, head of programmes in west Africa for Street Child, a UK charity, estimates that 12,000 children lost one or both caregivers to the virus. "Orphaned children found themselves leading the household; teenage girls became pregnant as they exchanged sex for food to survive; and poverty increased for already poor families who found themselves caring for the additional children of deceased relatives," she says.

Outbreaks such as Zika and Ebola should serve as a reminder for governments that it makes more financial sense to research the effects of mosquito-borne diseases before they cause widespread and expensive health crises, says Vasconcelos. "We need to be quicker and better at researching lesser-known infectious agents before they cause epidemics," he says.

Back in Olinda, Stefani doubts she will have time to finish her studies or go to work as Maria Eduarda grows up. While Pereira will officially adopt the child, Stefani cares for the baby girl as if she were her own. "I didn't really know what I wanted to do as a job anyway," Stefani says. "Now it doesn't matter." ●

PHOTOS: GETTY IMAGES; SAMANTHA PEARSON

From bottles to births

A simple but effective invention by an Argentine mechanic could help ease complicated births.
By **Andrew Jack**

The project
Becton Dickinson, a US medical technology company, is developing a simple device to ease complicated births around the world, in partnership with its Argentine inventor and the World Health Organisation.

The need
A quarter of all neonatal mortality and nearly half of stillbirths occur during labour and child delivery, with an estimated 9 per cent of all maternal deaths caused by prolonged or obstructed labour. The current use of forceps and vacuum extractors has been unchanged for decades. Both are complex, carry risks for mother and baby and require healthcare workers with a level of training not always available in low- and middle-income countries. The alternative is caesarean section, but this requires access to surgical facilities and increases the cost and risk of infection.

How it works
The Odón device was conceived by Jorge Odón, a car mechanic who was inspired by a simple method to remove a cork from a bottle using a plastic bag. Becton Dickinson is spending $20m developing, testing and scaling it for use in childbirth. The basic design consists of an applicator to locate the baby's head and a plastic sleeve with a pump and inflatable collar to deliver the baby. The plan is to launch it in 2019.

The impact
A first testing of the device on 48 women in Argentina showed very promising results, and a larger-scale clinical trial is set to begin in South Africa this month ahead of clinical trials in Europe and India in 2017. With plans for modest pricing in lower-income countries, cross-subsidised by higher prices in richer ones, it offers potential for improved, affordable and accessible birth assistance.

What is needed next?
- Regulatory backing if the device is shown to be safe and effective, so that it is rapidly approved in many different countries without imposing additional requirement and delays that slow its uptake.
- International funding from donors or investors to help order, manufacture and distribute widely, so it can achieve economies of scale and permit a cross-subsidy to make it affordable to the poor.
- "Last mile" support to integrate the device with state and non-governmental organisations, to supply, train and provide widespread access to women even in the poorest and most remote areas.

Want to help?
Email: showcase@ft.com

Not in public, please

Social conservatism and a lack of sound advice from healthcare staff make many nursing mothers in Poland feel like pariahs

By **Zosia Wasik** in Warsaw
Photographs by **Piotr Malecki**

Zuzia Jesionowska, Marta Andreasik and Ania Niziolek all agree they have been lucky. The young mothers have breastfed their babies all over Warsaw without receiving any negative comments. They also realise their experiences are not the rule in Poland. Before Jesionowska became a mother she did not understand why a woman would breastfeed in public. Now, she says, she feeds seven-month-old Mikolaj anywhere. Andreasik has even breastfed her six-month-old, Amelia, in a church. Niziolek's son, Ignacy, is 21 months old and eats solid food but she still breastfeeds him occasionally. She covers him with a scarf to avoid attention.

In Poland, breastfeeding in public is a controversial topic. Liwia Malkowska made headlines in August when she took her six-month-old daughter to a restaurant in Sopot, a seaside resort on the Baltic. When the infant began to cry she attempted to breastfeed her at the table. Before she had unbuttoned her blouse, a waiter told her to move to the toilets.

In response, Krzysztof Smiszek, head of the Polish Society of Anti-Discrimination Law, is suing the ➤

While you wait Marta Andreasik breastfeeds her six-month-old daughter Amelia at a bus stop in Warsaw


217
323
N81

1.
Zuzia Jesionowska with her son Mikolaj, aged seven months, in Warsaw
2.
Feeding time for Mikolaj at a café
3.
Polish women march to protest proposed anti-abortion legislation

1.

'It is easier to get a formula than to get good advice about lactation from a midwife'


2.

restaurant for discrimination. It is an unprecedented case in Poland and one of very few that have been made across the EU. The society has also filed a request to a Polish judge to direct the question to the European Court of Justice. If the ECJ rules that stopping mothers from breastfeeding in public is discriminatory and thus illegal, it is likely to set a precedent for all EU member states.

Malkowska's case has triggered a public debate in Poland. According to Institute of Media Monitoring records, public breastfeeding-related content was viewed 20m times and provoked more than 100,000 online interactions in the week after the incident. The majority of comments were in support of Malkowska, but there were also critics, like Marek Migalski, a former MEP, who compared breastfeeding to "farting".

Smiszek says he has received calls from people angry at what they see as his promotion of "moral laxity". But, he says, "some people also said [this case] is only the tip of the iceberg and that women are being maltreated in shopping malls, restaurants. We touched an issue that had been swept under the carpet."

In October, Polish women forced another issue into the limelight. Tens of thousands of them marched on the streets, dressed in black, to protest against a ban on abortions proposed by the ruling conservative Law and Justice (PiS) party. The demonstrations prompted the government to pull back from its plan, at least for now.

Progress in other areas of childbirth and care has been patchy, says Joanna Pietrusiewicz, head of the Foundation for Childbirth with Dignity, a Polish non-governmental organisation that seeks to protect the rights of pregnant women and mothers. The foundation celebrates its 20th anniversary this year and its experts say that although there has been some progress in increasing the safety of medical procedures during childbirth, it is not enough. "There is another issue: a human approach to perinatal care. Here Poland still has a lot to do," says Pietrusiewicz. Normalising breastfeeding in public is one of the foundation's goals. Pietrusiewicz has no explanation for why the debate on the subject is so heated in Poland. "Is it because breastfeeding is very intimate? Or, in a conservative mentality, a woman should sit at home with her baby? Or maybe because it is connected to a physiological act?" she asks.

Mortality rates in Poland

3

maternal deaths per 100,000 live births

5

deaths of children under five per 1,000 live births


3.

PHOTO: GETTY IMAGES

Agata Aleksandrowicz, who writes a popular Polish blog about breastfeeding, thinks that mothers who nurse openly are not socially accepted because there are simply not very many of them: "These women are not visible in public spaces, so breastfeeding becomes a very rare phenomenon, something unwanted," she says.

The World Health Organisation recommends babies are exclusively breastfed up to six months of age, with continued, complementary breastfeeding for another two years or more. This helps mothers by speeding up their recovery after childbirth, and babies too, as breast milk contains all the essential nutrients for their development. In Poland, any woman who follows these guidelines and is unable to breastfeed openly would find her lifestyle severely restricted.

Almost 99 per cent of Polish mothers want to breastfeed their babies when they leave hospital. But most soon give up — only 14 per cent breastfeed exclusively until their baby is six months old, according to research by Urszula Bernatowicz-Lojko, a neonatologist.

"Whatever issue we look at — breastfeeding in public, the expertise of medical staff, the knowledge of mothers, the advertisement of formula milk — the topic has been neglected and no one has ever done enough to fix it," says Aleksandrowicz. The problems begin in maternity wards, where every third newborn is fattened with formula, according to a report by the Supreme Audit Office. Producers sell modified milk cheaply, or even give it away, which means babies quickly get used to bottles.

Midwives often do not have up-to-date knowledge on lactation, says Pietrusiewicz. "It is easier to get ➤

'Women say they feel embarrassed; they get a sense that breastfeeding is not welcome at their company'

a formula than good lactation advice from a midwife." Paediatricians and gynaecologists — the first specialists women see after childbirth — are similarly short on proper advice: 45 per cent of doctors recommend women experiencing problems with lactation to bottle-feed instead of breastfeeding. Only 7 per cent suggest an appointment with a lactation expert, according to a report from Nutropharma, a company that produces Femilakter, a supplement for breastfeeding mothers.

Another problem is the advertising of formulas. Poland has committed to comply with the recommendations of the WHO's International Code of Marketing of Breast-milk Substitutes, which restricts the marketing of such substitutes to ensure that mothers are not discouraged from breastfeeding. It also includes a ban on product sampling and advertising, but since the code is not binding, Poland has implemented only a few of its recommendations. As a result, formula is advertised in the media next to articles on breastfeeding or healthy nutrition. In shops, processed baby food is available for four-month-old infants. The top hits in a Google search of "breastfeeding" in Poland are links to Pampers nappies and campaigns organised by formula producers Nutricia and Nestlé. In the UK, by comparison, the top two links are to National Health Service webpages on the benefits of early and continued breastfeeding.

Breastfeeding is even more problematic for working mothers. Under the Polish labour code, nursing mothers can take two 30-minute breaks a day to express breastmilk. "We do not know how [that law] is implemented," says Pietrusiewicz of the Foundation for Childbirth with Dignity. "We get information from women who say they feel embarrassed; they get a sense that breastfeeding is not welcome at their company."

Workplaces do not usually provide women with private places to nurse — half of women claim no space is made available in which they can express breastmilk. The lack of such facilities, and the negative attitudes of employers and colleagues, force 74 per cent of women to stop breastfeeding prematurely, according to the Nutropharma report.

New initiatives aim to empower women to breastfeed in public. The Land of Milk and Love foundation, for instance, creates comfortable corners for mothers in museums. "A drop bores through rock. In this case, a milk drop," says Patrycja Soltysik, the head of the foundation, who was herself rebuked while breastfeeding her son in public — an episode that she says spurred her to take action.

Pietrusiewicz says public promotion of breastfeeding is crucial to give mothers knowledge and choice. "We can make 100 per cent of women breastfeed, but that is not what it is all about," she says. "It is about women being relaxed, calm, happy and able to experience their maternity the way they feel it should be." ●

Home comforts
Ania Niziolek with her son Ignacy, aged 21 months, at her flat in Warsaw

‘These are not “wicked problems” without solutions’

Preventing maternal deaths requires more than just drugs and tools, says **Oona Campbell**

A deep, dark and continuous stream of mortality” is how William Farr, working in the General Register Office in England in the 1870s, described deaths in childbirth. Yet since then, particularly from the 1930s onwards, maternal deaths in the UK have plummeted, to become almost invisible today at nine deaths per 100,000 live births. How did it happen and what worked to bring this about? Can we transfer the lessons to countries such as Chad, where women face a risk of dying that is more than 180 times higher than in high-income countries?

The dream of the quick fix — the intervention, the tool, the drug, the one thing that will stop mothers dying — endures. The closest we have come to one are drugs and devices that help women to avoid giving birth: contraceptives, emergency contraceptives, abortion by medication and other safe methods, that can prevent unwanted and mistimed births.

They are effective and easy to distribute even to rural areas. A 2012 study published in The Lancet medical journal estimated that 29 per cent of maternal deaths could be averted by giving women access to family planning when needed.

But women, families and societies everywhere want and need to ensure that women and their babies survive childbirth too, just as they do in rich countries. Drugs are essential but, even with them, simple solutions elude us.

Haemorrhage, the leading cause of maternal death worldwide, can be prevented and treated using uterotonics such as oxytocin. Given preventatively, they can halve the risk of haemorrhage and should be available to all women who give birth, as a cost-effective intervention. The pharmaceuticals industry is working on producing forms that are easier to deliver to women, such as uterotonics that do not require refrigeration.

Technical and advocacy work is also under way to ensure these kinds of crucial medicines are on national essential drug lists, that supply chains function correctly to make them available at health facilities everywhere and that health workers know what to do with them.

But while uterotonics can prevent, reduce and treat haemorrhage, and have other useful applications, they can be misused — to unnecessarily induce labour early, for example, or to augment and strengthen contractions without good reason. The same drugs, then, can both help and harm women and their babies. Some women get too little, too late; others too much, too soon. Without informed, supervised and caring health workers, an apparently simple solution becomes a complex problem.

We need to look beyond materials to management. Good-quality care and effective interventions do not centre on drugs or tools, but instead require systems to work: facilities, healthcare providers, emergency medical transport, governance, information and financing.

Countries such as Cambodia are tackling this issue on multiple fronts. As a result, maternal mortality has dropped from 1,020 per 100,000 live births in 1990 to 161 in 2015. Challenges remain: in common with other low- and middle-income nations, ambulance numbers in the country are increasing rapidly, but a lack of coordination compromises their impact.

Cambodia is working to improve links between facilities, help health centre and hospital staff to review referrals, discuss improvements, standardise referral guidelines and promote provincial-level obstetric care hotlines. These efforts should help the country continue its progress in terms of maternal health and making sure women and babies are transported to the care they need. Scaling up such systems will benefit not just women and babies but also improve emergency care for everyone who needs it.

Ultimately, interventions to guarantee that women and babies survive this riskiest period need to function in complex ways. Healthy women, wanted pregnancies, caring and skilled healthcare providers and engaged and problem-solving policy-makers and communities are the ultimate effective interventions. These are not “wicked problems” without solutions. They are rather hard problems that require capacity, care, integrity and thoughtfulness. That success is achievable. ●

Oona Campbell is professor of epidemiology and reproductive health at the London School of Hygiene & Tropical Medicine

Denied a pardon Mirna Ramírez received a 12½-year sentence for attempted murder after giving birth prematurely in a latrine

‘An aggressive, punitive attack on women... a witch-hunt’

Rights groups and even the UN have called El Salvador’s draconian anti-abortion laws an ‘injustice’, with women jailed for murder and doctors working in a culture of suspicion

By **Jude Webber** in San Salvador
Photographs by **Bénédicte Desrus**

Mirna Ramírez's dream was a modest one: to raise a couple of children. She watched her first child, a boy, die at four months of a brain abnormality. Worried the same thing might happen again, she kept her second pregnancy quiet. But a month before she was due to give birth, she went into labour prematurely and her daughter fell into a latrine. The baby survived, but Ramírez was arrested for attempted murder and sentenced to 12-and-a-half years in jail.

The 48-year-old Salvadoran blinks back tears as she describes seeing photographs of her daughter learning to walk, and birthday celebrations she could never attend. "My life has been a failure," she says.

Ramírez was convicted under anti-abortion laws so draconian that not only seeking to terminate a pregnancy but even suffering a miscarriage or complicated premature birth can put a woman behind bars for as long as 40 years under charges of aggravated murder. Pro-choice activists say El Salvador's enforcement of anti-abortion legislation is harsh even among countries where the law comes down emphatically against terminations. It has created a culture of suspicion, they say, in which women are presumed guilty and reported by the very health professionals they turn to for help.

The atmosphere in the public health service has become pernicious. Doctors and staff fear that failure to report a suspicious case will cost them their jobs or have them charged with complicity. Many state hospitals are no longer a sanctuary but the last place a woman who has tried to abort or suffered an obstetric emergency can go, even if she is bleeding so badly she could die.

Activists put the number of women jailed on abortion-related charges at 49 — some for a procedure that millions of women worldwide consider their right, others following medical emergencies or miscarriage (the term in Spanish is "spontaneous abortion"). Other estimates give double that number of women imprisoned.

"Where is the criminal intent in miscarriage?" asks Dennis Muñoz, a lawyer working with rights groups to free women in prison on abortion charges in Central America's smallest country. In a society that is reeling from violence between brutal street gangs, the harshness of the punishment seems particularly unjust to Muñoz. "You might as well be judged for sneezing," he says.

Until about 20 years ago, El Salvador permitted abortion if the woman's life was at risk, if foetal malformation made the baby's life unviable or if the pregnancy was the result of rape. Despite the influence of the Catholic Church, which teaches that life begins at conception, private clinics offered semi-clandestine abortions — taboo but quietly tolerated, expensive but not exorbitant.

But following lobbying by anti-abortion groups, a new penal code took effect in 1998, outlawing abortion outright. Chile, Honduras and Nicaragua are among Latin American countries with similar bans, but El Salvador is unique in instituting what Dee Redwine, head of the Latin American programme at the Planned Parenthood Federation of America, a US abortion provider, calls "an aggressive, punitive attack on women… a witch-hunt is a very good way of putting it".

Carmen Vásquez Aldana, a domestic worker who became pregnant after being raped at the age of 17, delivered her baby alone in an unlit room in her employer's house. The baby died. Hours later, still bleeding profusely, she was taken to hospital, where she woke up handcuffed to the bed.

'Where is the criminal intent in miscarriage? You might as well be judged for sneezing'

Vásquez was pardoned last year, after serving seven years of her 30-year sentence for aggravated murder. The ruling recognised "she was convicted on the basis of mere presumptions" and the sentence was "disproportionate, excessive, severe and unjust" — especially since the baby's cause of death had never been established.

Her release followed a campaign to free 17 women serving long sentences, spearheaded by Morena Herrera, El Salvador's leading advocate for abortion law reform. Arguing that the women are victims rather than criminals, activists filed simultaneously for pardons for the entire group in April 2014, but only Vásquez's suit was accepted. Ramírez, who had been allowed in the later years of her prison term to work outside the jail and to visit her family during the day, was freed for good behaviour. A pardon was denied on the grounds that she had almost finished her sentence. The other 15 suits were rejected and activists are still fighting to have these sentences commuted or reduced.

Even if appeals succeed, victory may be short-lived. In May, María Teresa Rivera, who had served four years of a 40-year sentence, was freed after the judge acknowledged errors in the case, but prosecutors are now appealing against the ruling.

Sitting on the plant-filled patio of her house, Herrera drinks black coffee and sucks on cigarette after cigarette. A former guerrilla fighter in El Salvador's civil war between 1980 and 1992 and a mother of four daughters, she looks unshockable. But she shakes her head incredulously as she recalls the story of a middle-class friend who was so desperate for help after her daughter tried to abort and was bleeding profusely that she was willing to take her to a public hospital.

1.
Salvadorean women rally to demand the decriminalisation of abortion in front of the Legislative Assembly this September

2.
Morena Herrera, a former Marxist guerrilla, now director of the San Salvador Feminist Collective and pro-abortion activist

PHOTO: AFP/GETTY IMAGES

2.

"I'd rather you were arrested than dead," she recounts the friend telling her daughter. "I can get you out of jail, but not out of the cemetery." The young woman eventually escaped punishment because she was taken to a private clinic.

Activists say each of the 17 women is guilty of nothing more than going into labour prematurely, without a midwife or doctor present, and often without having had any antenatal check-ups that could have detected gestational problems. They have to prove their innocence.

Ramírez's baby was born at eight months. "I didn't touch her. She just came out," she says. After helping to rescue the baby, who was alive, a neighbour called the police. "They said I had her and threw her in [the latrine]," says Ramírez. When she was taken to hospital, it was in handcuffs in a police car — the start of a legal odyssey of more than a dozen years that ended in October 2014 when the Supreme Court approved her release. By that time, she had less than a month of her original sentence left to serve.

In a statement, the UN applauded Vásquez's release, saying it "reverses an appallingly unfair sentence… but there are many more women imprisoned on similar charges". It is time for El Salvador's government to review the abortion ban "to end such injustices", the statement urged. El Salvador's justice ministry would not comment.

Mortality rates in El Salvador

54
maternal deaths per 100,000 live births

17
deaths of children under five per 1,000 live births

American pro-choice campaigners are watching the situation in El Salvador closely, as abortion rights, enshrined under the landmark Roe v Wade case in 1973, are being eroded in some US states. "Since 2011, we have seen more than 334 abortion restrictions enacted in 32 states — that's huge," says Elizabeth Nash, senior state issues manager at the Guttmacher Institute, a Washington-based non-profit organisation that focuses on sexual and reproductive health.

The result of El Salvador's ban is a gaping social divide between those who can afford an abortion in a private clinic where doctors feel no pressure to report their patients, and those forced to rely on the flourishing back-street abortion industry.

Misoprostol, an abortion-inducing drug, is readily available on the black market. The less well-off resort to caustic soda tablets or coathangers, doctors and activists say. With no medical follow-up, the third of El Salvador's 6m people who live in poverty have the fewest options when things go wrong.

Camila — whose name has been changed to protect her identity — feels she got off lightly. Now 24, she was 15 when she found out she was pregnant by her 16-year-old boyfriend. "He looked on the internet, went to San Salvador and bought two pills for $80," she says. "I don't know what they were." Within hours of taking the dose, she was haemorrhaging. Unable to confide in ➤

1.
Delmi Ordóñez, who spent 11 months in prison for murder before her case was dismissed, with her three-year-old son
2.
Morena Herrera with Jorge Menjívar, a spokesman for Citizen Group for the Decriminalisation of Abortion
3.
Sara García Gross and lawyer Dennis Muñoz on a San Salvador radio programme called 'From the Hospital to the Prison'

1.

2.

her mother, who still does not know she had an abortion — "she'd kill me" — she went to a friend's house. "When I couldn't stand it any more, I went to hospital."

There she was grilled about what she had taken and who had helped her, but in the end, her age saved her from being reported by the hospital staff. Then, two years ago, Camila was raped by her father, and the nightmare loomed again. In the end, she did not become pregnant. "If I had been, my life would have been over," she says.

"[Abortion] is more penalised than any crime," says Delmi Ordóñez, who, like Ramírez, gave birth in a latrine. Doctors say some women deliver into toilets because of cervical incompetence. Bathed in blood, Ordóñez fainted after the birth, she says, waking up in hospital to find doctors demanding to know what she had done with her child. Because she had been using injected contraceptives, Ordóñez had not even known she was pregnant, although she already had a son. "They decided it was an abortion — no one knew, so I must have covered it up." The baby, which Ordóñez never saw, was found dead in the latrine by firemen. A blow to its head was proof enough for the authorities that this was murder.

Once Ordóñez was out of danger, she was arrested, and spent the next 11 months in prison. The case against her was finally dismissed, but she still feels consumed by guilt, even five years after her release. "I practically felt I'd killed him because I didn't take proper care of myself. I didn't realise, I didn't go to the doctor," she says.

The abortion ban has widespread support in El Salvador, where machismo and religious faith run deep. A survey by the Latin American Observatory of Drug Policy and Public Opinion, a think-tank Asuntos del Sur, found Salvadoran support for abortion to be the lowest in the region — about half the level of surveyed countries overall — although support among young people was growing.

'They decided it was an abortion — no one knew, so I must have covered it up'

It took the dramatic case of Beatriz in 2013 to thrust the issue into the spotlight. The 22-year-old, identified only by that name, was denied an abortion by El Salvador's Supreme Court, despite the fact that she suffered from lupus and doctors had warned the pregnancy was putting her life at risk.

The court refused on the basis that it was upholding the constitutional right to life from conception and that a woman's human rights could not take precedence over those of her unborn child. That Beatriz's baby also had a defect called anencephaly, in which parts of the brain do not develop, made no difference. Babies with the condition rarely survive more than a few hours.

The Inter-American Court of Human Rights urged the government to save Beatriz's life. "In the end, she started to have contractions and they had to perform a caesarean," Herrera recalls. The baby died within hours.

Beatriz's ordeal prompted María Isabel Rodríguez, then El Salvador's health minister, to call for a change to the law. She has called it a "crime" and an "injustice".

In October, Lorena Peña, president of El Salvador's Congress from the ruling FMLN party, referred to Beatriz's case when she introduced a bill to decriminalise abortion if the mother's life is at risk, if the pregnancy is the result of rape, if the baby's life is not viable or in the case of under-age girls. "Here we are not the holy inquisition — this is the Salvadoran assembly in the 21st century," Peña said. Her proposed amendment to the penal code would restore a right enshrined in Salvadoran law from the late 19th century until 1997, she said.

But Herrera expects the bill to run into tough opposition from the conservative Arena party. She has been called an apologist for what is considered ➤

3.

Behind these bars
Ilopango women's prison on the outskirts of San Salvador where women have been held on abortion-related charges

by many Salvadorans to be a heinous crime. Even in the Ilopango women's jail — where most of those convicted on abortion charges have been incarcerated — sympathy can be in short supply. Ramírez and Ordóñez say that during their time in prison they kept quiet for fear of being branded "baby killers".

Rosa (her name has been changed), a gynaecologist who quit the public health service, says that "many times" she refused to report suspected abortions and falsified her patients' medical reports. Eventually, she switched to a private clinic, helping two to four women a month to abort, provided they were referred through people she knew. "If someone comes to me that I don't know, I can't help them. It makes me mad, but I can't expose myself [to the risk] either," she says — potentially six to 12 years in prison and the permanent revocation of her physician's licence.

"You don't know who you can trust. It's very risky and I don't think that's going to change," says Valentina (also not her real name). Despite being a health professional herself — she is a dentist — she did not know where to turn after suffering complications from taking misoprostol. She was referred to Rosa. Private abortions can cost as much as $3,500 and Rosa says she has colleagues who perform them as a sideline, with the proviso that patients do not know their names or see their faces.

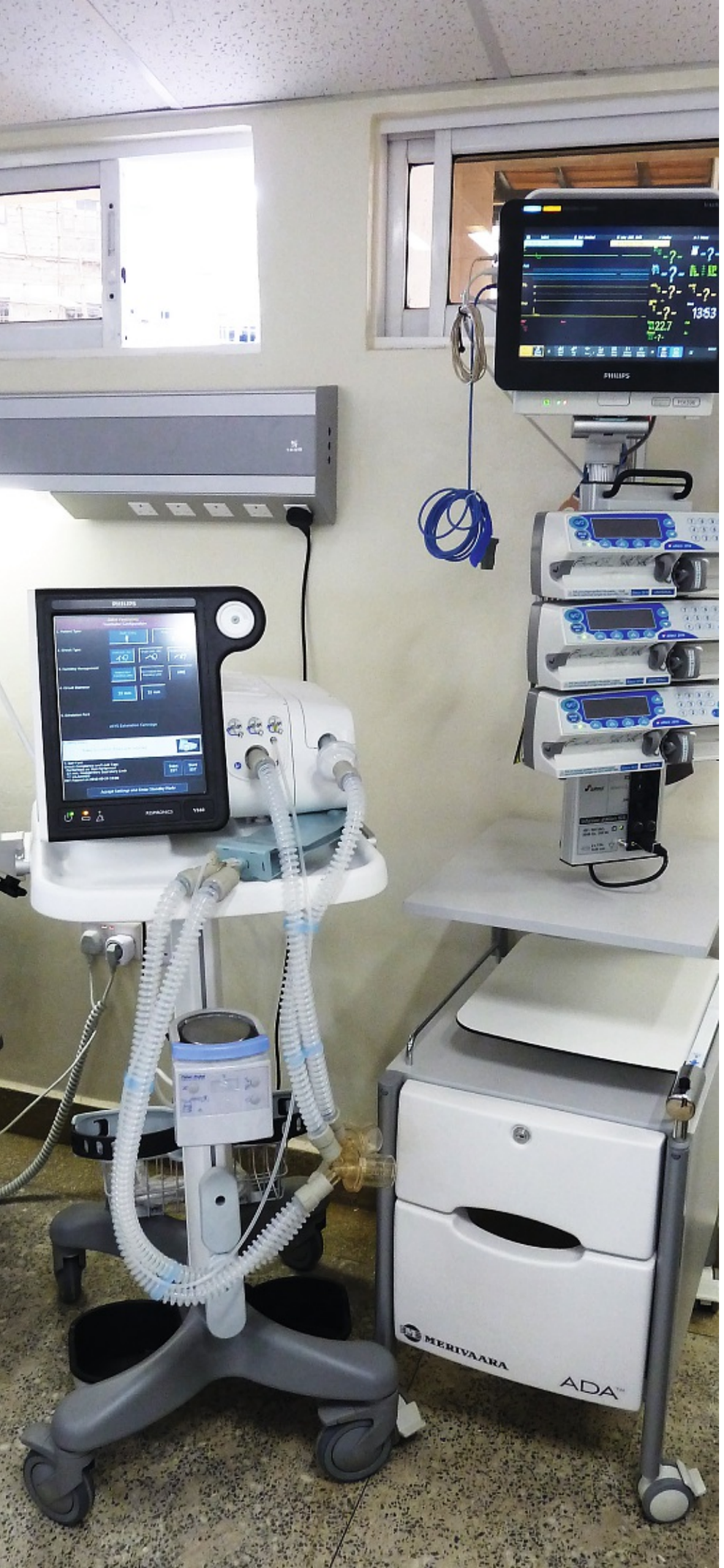
The most "absurd" thing, Rosa says, is she knows that in theory the law protects her: it says doctors are not required to breach patient confidentiality. Another safe-abortion practitioner nicknamed "Dr Help", who charges his patients between $100 and $1,000, depending on their ability to pay, adds: "I know my rights and obligations as a doctor. My job is to provide medical help. I'm not a policeman."

This is the same point made by Muñoz, the lawyer. Talking fast and thumbing through his three-inch-thick copy of El Salvador's Criminal Procedural Code, he points to the relevant articles that, he says, protect doctors — despite a requirement that hospitals report injuries sustained as the result of a suspected crime. One of his defendants, Carmelina Pérez, a Honduran, was given a 30-year prison sentence in 2014 after the doctor who reported her to the police gave evidence in court. Later that year, in an appeal, Muñoz successfully argued the doctor should have refused to testify under article 205, which establishes that patient confidentiality requires that doctors not testify against their patients. "This is now a legal precedent," he says, triumphantly.

But Muñoz's celebrations have been short-lived. Although Pérez was released and returned to Honduras, the court order freeing her has itself since been revoked. A judge has accepted an appeal by prosecutors to reopen the case. El Salvador may have to issue an international arrest warrant to get her back before a judge.

Herrera compares the case to that of Sonia Tábora, who was jailed in 2005 for 30 years after giving birth while working in a coffee field. According to activists, the baby was either born dead or died soon afterwards, and was buried in the field; Tábora, bleeding, fainted. Her case was reviewed after seven and a half years and she was freed. But that review was struck down. Tábora must go back in the dock even though she now has another small child.

There is no trace of the tough guerrilla as Herrera contemplates what could happen next. "I just don't know what I'll do if they convict her," she says. ●



Contracts for care

A scheme to provide medical equipment across the country.
By **Andrew Jack**

The project
An ambitious 10-year, Ks38bn ($375m) "turnkey" financing and delivery contract between the government of Kenya and five international companies to provide and maintain medical equipment across the country and train users.

The need
In many poorer countries, medical equipment to improve diagnosis and treatment is in scant supply. Even where it has been purchased in the past, the absence of adequate staffing, training and maintenance means it frequently breaks down and is abandoned. The high up-front costs are a barrier to governments buying equipment and improving their services.

How it works
The Kenyan government launched an international tender and contracted companies to supply and support radiology, intensive care units, dialysis and surgical facilities in hospitals in all the country's 47 districts. It has undertaken to provide the basic infrastructure, while the companies supply and ensure that their equipment is functioning 98 per cent of the time, receiving payments every quarter if they meet these targets.

The impact
The contract, for which negotiations began in 2014, is now operational, with facilities across the country, while previously many of the services were only available in one or two places. Initial evidence suggests that it is functioning well, improving the reliability, speed, access and accuracy of services to tackle ill health more rapidly and efficiently. It has also generated large numbers of local jobs, from healthcare workers to technicians, and triggered risk-sharing and funding between the providers and local financial institutions.

What is needed next?
- Technical support for legal advice, insurance and finance for future expansion or replication.
- Evaluation to establish clear baselines and, over time, measure the wider impact of the programme, including its effect on increased identification and demand for services, and changes in outcomes and cost.
- Broader funding, including the introduction of healthcare expenditure to ensure sufficient staff and facilities to cope with the equipment and the referrals that result.
- New vendors to extend the programme to other functions, including laboratory equipment, neonatal and dental care, and laparoscopy.
- Other countries to follow Kenya's pioneering model in Africa, adapting a model more typically found in richer nations.

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Life or death
An ambulance heads off on a 20-mile journey to bring a teenage girl in labour to Moyamba government hospital

The slow road to progress

Sierra Leone is thought to have the world's highest maternal death rate, but to address its myriad causes the government must first gain the trust of its people

By **Finlay Young**
Photographs by **Tom Pilston**

1.

It is just before 6pm when the call comes in to Tom Swaray's mobile phone. The sun in Moyamba District in Sierra Leone's Southern Province is well on its way to setting. The information he receives is scant. An unnamed pregnant girl — 17, maybe 18 — has been in labour for 12 hours. She is in a town called Rotifunk. "Not too far," Swaray says, and calls for one of his ambulances.

Forty-five minutes later the Toyota Land Cruiser pulls up next to the empty white tarpaulin tents that were originally pitched to treat Ebola patients and are now the district's medical centre. The light is fading as the driver, Michael Elie, sets off over the ferrous dirt to find a nurse at Moyamba government hospital. He emerges with Jane Fatmata Kamara, pulled from her triage night shift, and the two set off into the dark.

The girl they are going in search of became pregnant in a place where death often follows birth. Sierra Leone is thought to have the highest rate of maternal deaths of any country in the world. Women here have an estimated one in 17 chance of dying from pregnancy or child birth-related causes. To place this figure in historical context, UK parish records show better odds for English mothers in the early 1700s.

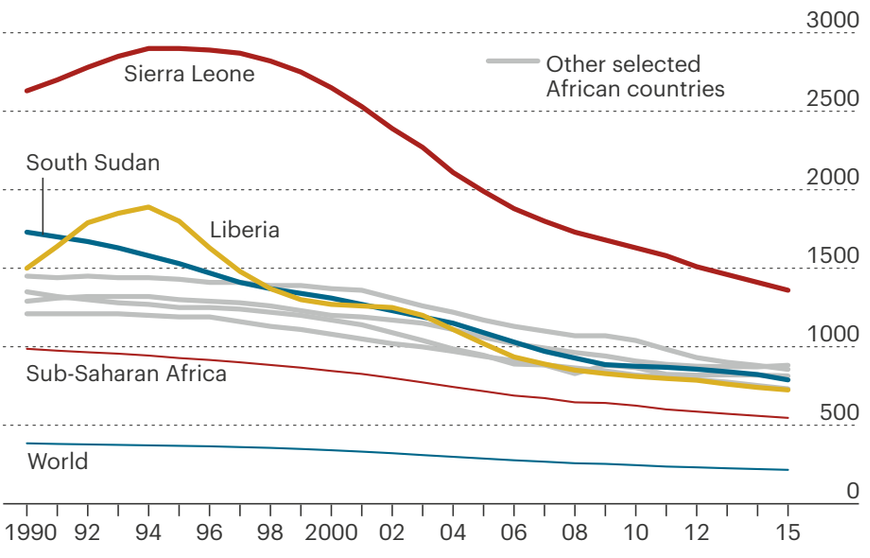
The same maladies that killed those British women 300 years ago are killing women in Sierra Leone and across sub-Saharan Africa today: haemorrhage, sepsis, hypertensive disorders, illegal abortions, obstructed labour. All can be treated successfully with basic interventions, as long as what public health specialists call the "three delays" do not supervene: in seeking care, reaching care and receiving care.

That is why Elie and Kamara drive at breakneck speed along the narrow, perilously veined, cratered road to Rotifunk. On the map it is only 20 miles, but time and distance have an uncertain relationship in rural Sierra Leone. The unnamed girl and her unborn child wait, the risk to one or both of their lives rising every minute.

Sierra Leone's dubious distinction is not just its supposedly record-breaking rate of maternal death. A World Bank line graph plotting the World Health Organisation's estimated maternal mortality rates for low-income countries over the past 25 years shows war

Maternal mortality ratio

Per 100,000 live births



Source: World Bank

2.

Before the Ebola outbreak deaths were not habitually reported — they were a family or community matter

zones such as South Sudan and the Central African Republic closely bunched together. But Sierra Leone's line, while decreasing gradually from a high during its own 1990s war, is extraordinary.

It floats high above the whole motley crew at 1,360 maternal deaths per 100,000 live births as of 2015. This estimated ratio is almost three times higher than the average for sub-Saharan Africa. If the figures are correct, around 3,100 women will have died maternal deaths last year alone; 3,956 men and women died in Sierra Leone during the Ebola outbreak of 2013-16. The statistics are a mark of continuing infamy for the country.

"We need to say something about those figures you are using," says Dr Santigie Sesay at his office in Freetown, Sierra Leone's capital. Dr Sesay is the government's director of reproductive and child health, responsible for coordinating the state's response to maternal death. "We've put in place a maternal death surveillance and response team, and developed a technical guideline. When a death is reported, they go and confirm."

It sounds simple. From January to August this year, 432 maternal deaths were recorded by the ministry of health and sanitation. According to their figures, even allowing for some under-reporting, the collective wisdom of the WHO, Unicef, the UN Population Fund and the World Bank is exaggerating Sierra Leone's problem by a factor of four. Either that, or about another 1,000 Sierra Leonean women died maternal deaths in the first half of this year, and Dr Sesay had no way of knowing about it.

1.
Advice is dispensed at the Tikonko community health clinic in Bo District

2.
Hawa Koi holds her baby Naasu after returning home

Before the Ebola outbreak deaths were not habitually reported to the government in Sierra Leone. The business of death is a strictly family or community matter and the reports were of little value to the state. But when the outbreak came, data on who died, where and how, suddenly became vital to stem its spread.

Reporting every death was made mandatory. Initially, people were resistant, dreading the prospect of their loved ones being slung into the next life by a stranger in a hazardous materials suit. However, more resources were mobilised and surveillance increased at the community level. There was a surge in reporting across the nation. But as the epidemic abated, so too did the higher rates of death reporting. Now, according to the ministry of health's own surveillance update for September 2016, only around a quarter of all deaths are being reported.

The ministry of health requires poorly paid community health workers to report maternal deaths to health facilities, which in turn must report to district-level medical teams. Possible weak links abound in this system, not least because those government employees doing the reporting are the same people under pressure to ensure that mothers do not die in their communities.

A few days after my meeting with Dr Sesay, a baby girl called Naasu Koi arrives into the world at the Tikonko community health facility in neighbouring Bo District. Her mother, Hawa Koi, has attended prenatal classes at the clinic throughout her pregnancy and made the two-mile journey from her village to deliver her fourth baby into the familiar arms of nurse Irene Moseray. It is a textbook birth.

Koi's mother-in-law, Miatta Momoh, who is older than she can remember, sits on a hard wooden bench ➤

1.
Pregnant women wait for a check-up at the Tikonko community health clinic
2.
Documentation at the clinic
3.
Massa Amadu with three of her adopted children — Hassan, five weeks, Kadiatu 15, and Joseph, 18 months

outside, waiting to see her latest granddaughter. The blue wall behind her has layers of faded posters from UN and non-governmental organisations — adverts for a different life. They tell her to consider an intrauterine device, to "use Mr Condom" and to get checked for Aids. Childbirth was a different experience for her, conducted at home with the help of senior women from the community — known as traditional birth attendants (TBAs). Sometimes mothers died, but no one was blamed. "It was the will of God. And if there was a delay in delivery, they would ask that woman. 'What have you done? Please tell us. Have you done something wrong to your husband?'" Momoh laughs. "But these things used to work to get the woman to deliver!"

The government concluded TBAs were a dangerous anachronism and tried to ban them from assisting births. In 2010, it launched a free healthcare initiative for pregnant women, lactating mothers and children under five. By-laws proscribing home births and imposing severe fines for mothers and those facilitating were also brought in. But TBAs are a fundamental part of the traditional structures that govern most people's lives and, unlike government health clinics, are present in every village. While facility deliveries did increase, by 2013, the last time the country's demographic and health survey was conducted, half of births in rural areas were still taking place at home.

Just that week, a horror story was doing the rounds at the ministry of health. It concerned a pregnant 13-year-old who had died recently in Bombali, in the north of the country. A TBA had locked her in a house during labour and by the time the community health worker broke down the door, it was too late. The image of the government representative, an outsider, trying to kick down a door locked by the trusted TBA seemed emblematic. While health workers may have access to the medicine, it is often the TBAs who have patients' trust.

Pragmatic solutions are needed. At Naasu Koi's birth in Tikonko, two former TBAs watched as the nurse delivered. Since 2014, as part of a project piloted in Bo District by Concern Worldwide, an international NGO, 200 former TBAs have been trained and rebranded as MNHPs (maternal and newborn health promoters). Instead of delivering babies in isolation, they visit, encourage, check for danger signs and refer pregnant mothers to healthcare facilities. The small amount of money and social status they previously attained through deliveries is now made through selling essential items to the mothers they visit. Rather than women being locked away from government healthcare, the TBAs' familiarity and influence in communities is being harnessed to help mothers access it.

According to the nurses at Tikonko, backed up by the town chief responsible for enforcing the community by-

The image of a government representative trying to kick down a door seemed emblematic

laws, Naasu Koi's birth was typical. No women in the area has given birth at home in the past two years, they say, and no one could remember a maternal death. At three more remote rural clinics, in Bo and then Moyamba district, I am told the same story: maternal death doesn't happen, not in this community, not any more. Death is elsewhere.

Mortality rates in Sierra Leone

1,360
maternal deaths per 100,000 live births

120
deaths of children under five per 1,000 live births

The next day I meet Massa Amadu, a 32-year-old nurse from Freetown sent to work in Moyamba City. Children fill every space in her small house. She has adopted six, three of whom have lost their mothers in the past two years in pregnancy or birth-related deaths. She thrusts the youngest, five-week-old Hassan, into my hands. "His mother needed blood and there was none. She had already borne 10 children," she says.

She has one son of her own, back in Freetown. "But I should have two," she says, showing a blurred picture on her phone. It is of a dead baby, Foray, wrapped in a white swaddle. He was the product of a relationship with a man who, unknown to Amadu, was already married. When his wife found out, problems began. "She took me to the herbalist — she wanted me to die." Foray died in his sleep soon afterwards and Amadu ended up with severe elephantiasis. She believes both misfortunes were punishments — products of the jilted wife's curse.

When the medicine her hospital gave her didn't work, Amadu began to visit a herbalist in a distant village. The elephantiasis reduced. It was from the same village that she adopted Hassan. Around his neck is a tiny amulet on a string. She puts my finger on his head gently, locating a small hole. "It's the traditional remedy for this," she says. The hollow is Hassan's anterior fontanelle, which can be felt in almost all babies. When it eventually closes, as it does in all children, Amadu will conclude that the charm played its role. "I take it off when I take him to my hospital though," she laughs. "We tell the patients not to use traditional medicine".

For Amadu, as for many people in Sierra Leone, traditional and modern medicine are complementary rather than in opposition to one another. Decisions on which to use might be based on what is most easily available, what seems to work or where one feels most respected. In childbirth, this presents a challenge. Some mothers will exhaust traditional remedies before seeking medical help. In remote areas, this leads to death. How to change this behaviour is part of a broader international development conundrum about how traditional practices viewed as harmful can be changed.

At the Tikonko health facility attendees at the monthly 10am antenatal class file in after noon. Some have walked up to five miles from villages while pregnant, and their fatigue shows. Eventually nurse Moseray begins a nutrition class, describing pictures of the correct food for pregnant mothers. The women's eyes glaze over, so she and TBA Susan Pormeh produce a gourd rattle. It brings the listless women to their feet, dancing, clapping and chanting enthusiastically in the local language, Mende, to an easily memorised song about good nutrition and hygiene.

This approach mimics one used in Sierra Leone's traditional secret societies, where song and dance predominate as teaching and expressive forms. Paul Richards, an anthropologist who has worked in Sierra Leone for more than 40 years, has recently published a book about Ebola. In it, he describes a "people's science" through which communities have changed their cultural norms around burial practice and traditional healing. In Richards' view, belief is formed by social action, not vice versa. In Tikonko, the gourd rattle seems as important a tool as the stethoscope in promoting maternal health.


3.

However high Sierra Leone's true maternal mortality rate might be, no single intervention can fix it. Whether through access to family planning, medication, prenatal care, emergency obstetrics, training of health staff, an effective referral system — not to mention tackling longstanding structural violence against women — the tide must raise all these boats at once. Old culprits such as corruption and inefficiency still hinder progress and there is insufficient funding for the task.

The underlying challenge is the need to bridge divides and suspicions between the helpers and the helped. In Tikonko, Moseray and Pormeh's method of interaction with the women is vital. The nurse is both an insider and outsider — a formal practitioner, but one who can speak the local language and does not patronise, embarrass or hector. In combination with the provision of good-quality services, this is why the women have turned up today, and why they will return to give birth. "The nurse is kind here," as Hawa Koi says. Perceptions of the state, and the quality of healthcare it offers, are not ➤

1.

1. and 2.
The girl brought from Rotifunk in labour with complications gave birth by caesarean section in the hospital in Moyamba

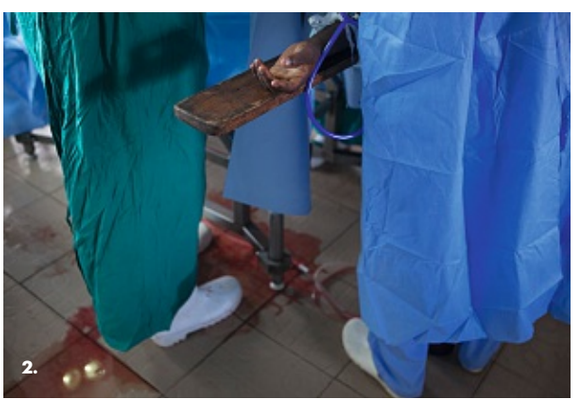
always so positive in a country where some citizens, confronted by the Ebola outbreak, concluded that their own government was trying to kill them. The distance between the urban and rural worlds, the deficit between the government and the governed, is wide.

Back in Freetown, Dr Sesay, in casting doubt on the WHO estimates, also identified a dubious utility for some in Sierra Leone's ignominious record of the worst maternal death rates in the world. "These people [NGOs] need very bad numbers to sell to their donors and make money," he says. "So most of the time they give out the negative part of it."

By email, Dr Lale Say, co-ordinator of the WHO's department of reproductive health and research, reiterated that the estimates are not precise figures, and encouraged caution making comparisons between countries. "The lower and upper estimates should be considered in such assessments," she wrote. However, even using the WHO report's lower estimate, Sierra Leone, would still have the highest ration in the world. Sonnia-Magba Bu-Buakei Jabbi, senior statistician at Sierra Leone's government-funded independent statistics body was clear: "Ministry of health and sanitation officials are just trying to paint a pretty picture."

By the time Elie and his ambulance finally arrive back at the Moyamba government hospital carrying the unnamed girl from Rotifunk, a full five hours have passed since her call for help. Her baby has still not come; the mother — probably younger than 17 — is just too small and her pelvis not wide enough. It is not clear whether the baby is even alive.

Hospital superintendent Dr James Jongopei, a



2.

youthful 32-year-old, decides on a caesarean section. In the operating theatre the following morning, surrounded by 11 hospital staff, he cuts open her belly and pulls out a tiny pink body from the red: a boy, premature. The umbilical cord is cut and the motionless, soundless baby is placed on a bright African lappa cloth incongruous against the clinical white and blue of the medical staff smocks. A mucus aspirator is pushed into his nose and throat and pumped, fluid sucked out again and again. The midwives lift him naked by his feet, vigorously massaging his back, trying to inspire circulation.

His mother needs a transfusion, and she is lucky: her blood type is common and the hospital blood bank is not empty this time. As the doctors sew her back up, her son finally coughs his way into life. There is a murmur of laughter among the delivery team. They have saved a life — two lives. ●

On the road

A scheme to bring health advice and medicine into the home.
By **Andrew Jack**

The project
Living Goods, a US non-governmental organisation, in partnership with Brac, the microfinance social enterprise, manages a network of paid community workers who provide health education, diagnoses, referrals and affordable treatments to villagers in Uganda.

The need
Many health systems are underfunded or badly managed, resulting in high unnecessary illness and death. They are often inaccessible, unattractive or under-staffed and without medicine stocks. Sometimes in more remote areas, they are supported by unpaid community health volunteers who are well-intentioned but frequently overstretched unsupervised or not supplied with medicines.

How it works
Inspired by Avon Ladies (who sell cosmetics door to door), Living Goods recruits trusted local independent part-time agents, trains them and pays them modest commissions on sales of essential medicines and other commodities such as water filters. Each goes door-to-door across a catchment area of 150-200 households and provides free health education and diagnosis using tools such as a *SmartHealth* app that draws on official health guidance. They receive additional incentives to register pregnant women and visit them 48 hours after birth to check on the health of the mother and child. In total, they earn $10-$20 a month. Service delivered to the home can be "cheaper than free" by removing the time and cost of travelling to clinics.

The impact
Living Goods plans to reach 5m people by the end of 2016. It costs $2 per person per year in the catchment area. A study published this year suggested the programme reduced under-five child mortality by 27 per cent compared with districts without the service. It has spread the model to Kenya, and has worked with partners in Zambia and Myanmar.

What is needed next?
- Funding to expand the project across Uganda and Kenya, providing scale and a chance to test how it operates as a national programme.
- Partnership with government and multilateral donors to contract directly with the organisation to provide community health services.
- Corporate connections for support in kind, including the supply of smartphones, SMS, new products, services and medicines.
- New countries willing to explore the model and develop a community health policy.
- Links with other organisations in target countries onto which Living Goods can piggy-back to expand.
- Advocacy groups to share experiences to lobby for improved community healthcare.

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PHOTO: AFP/GETTY IMAGES

‘Having 30 children in one house is not good’

High fertility rates and an economic crisis slow progress on maternal health. By **Maggie Fick**

Women in northern Nigeria have an average of more than seven babies. But nurse Aisha Saraki knows why she and her colleagues in the maternity ward at one of northern Nigeria’s biggest hospitals are not busier these days. “There is no money,” she begins, referring to the economic recession battering Africa’s biggest oil producer. “And they want something to eat,” she says of expectant mothers in the area.

Increasingly, women in the northern city of Gusau are choosing to save money by having their babies at home. A trouble-free delivery at the privately owned hospital costs the equivalent of $11, according to Saraki. That makes a hospital delivery unaffordable for most Nigerians. A UN study last year found that more than 60 per cent of the population live on $1.25 a day.

A growing economic crisis, amid already severe poverty in places such as Gusau, is the latest obstacle to efforts to rein in maternal mortality. But it is far from the only factor. Deeply rooted cultural and religious norms in the conservative north influence how many years of schooling girls and young women are allowed before marriage. Most girls in the impoverished north-west give birth in their mid-teens, according to the Demographic and Health Surveys Program, the US data provider.

Mortality rates in Nigeria

814
maternal deaths per 100,000 live births

109
deaths of children under five per 1,000 live births

Nigeria has one of the highest maternal mortality rates in the world — 814 deaths per 100,000 live births. According to the UN, the country makes up about 2 per cent of the world’s population but 10 per cent of total maternal deaths. Underlying these figures are deep disparities between the regions.

The country’s commercial capital, Lagos, is a centre of innovation in the continent’s tech start-up world. But a woman’s chance of dying a pregnancy-related death in Nigeria is one in 13, according to the UN, while just one-third of deliveries are with skilled birth attendants.

Public health experts say that, in northern Nigeria in particular — which is far less developed and prosperous than the south — studies show that women are having more children than they say they want to. This is a sign they may not have access to family planning options, control over their reproductive lives or the chance to make any decisions at all about their lives.

“It’s not just about family planning alone,” says Babatunde Osotimehin, executive director of the UN Population Fund. “It’s also ensuring women and girls are empowered with education.” He says UN agencies are engaging with political, religious and traditional leaders in the north in particular to find “champions within society who understand what we are trying to do”.

While some traditional leaders have begun to speak publicly about the importance of family planning and “spacing” for the sake of a mother’s health and that of her future children, politicians from the northern region are loath to speak up on a personal matter that is entwined with culture and religion.

“The political elite are the missing bit of the jigsaw,” says a development official in Abuja, who did not want to be named.

Some of the few people who are willing to speak directly are female students who are trying to beat the odds by staying in school. “We need to reduce our population now because we are facing huge economic challenges,” says Zainab Garba Jijji, aged 17. “Having 30 children in a house is not good. The government needs to tell people the truth.”

Saraki, the nurse, agrees but says financial strains caused by low oil prices will slow the government’s progress on critical issues such as education for girls, who will get married young and begin having high-risk pregnancies if they do not stay in school. “Through education, women are now understanding the problems they’ll suffer” from home deliveries and multiple pregnancies in rapid succession, she says. ●

‘We need to reduce our population now because we are facing huge economic challenges’

Kwara Care

A west Nigerian state wants to make health insurance affordable.
By **Andrew Jack**

The project
The government of the west Nigerian state of Kwara, US medical insurance agency Hygeia, the Netherlands government and health insurance fund PharmAccess Foundation have created the first state health insurance programme in Nigeria, to provide affordable and quality healthcare for poor people.

The need
Nigeria has the largest population in Africa. Yet this country, where most people live below the poverty line, has some of the world's highest maternal and child mortality rates. Nearly three-quarters of medical costs are paid by patients out of their own pocket, discouraging access to quality healthcare.

How it works
The scheme offers primary and limited secondary healthcare services, with premiums from poor people subsidised by the Dutch Health Insurance Fund and increasingly by Kwara state. Services are provided by both public and private healthcare facilities, which must participate in a medical quality improvement process. There is an extensive evaluation process.

The impact
Nearly 350,000 people have enrolled on the scheme and have made almost 1m visits to 42 facilities. The latest evaluation in 2013 concluded the scheme offered "considerable positive impact". Those covered by the scheme took far greater advantage of modern healthcare and spent less of their own money on health. Hospital deliveries rose 77 per cent and there was some evidence of a decline in hypertension. The cost was $28 per person per year.

Plans for the future
The aim is to shift from external funders to local resources, and to expand coverage to all residents of Kwara state. A state health insurance law has been developed and sent by the governor of Kwara state to the Kwara House of Assembly for discussion and adoption. The law is designed to create mandatory state health insurance, whereby richer people will cross-subsidise the poor. Since last year, Kwara state has been working on a health insurance fund.

What is needed next?
- Political support to create the state-wide health insurance system and to encourage similar approaches elsewhere.
- Technical advice for fine-tuning the health insurance system for a diverse population; training; and the creation of the planned state health insurance agency to handle issues such as management, contracting, monitoring and auditing.
- External funding for an estimated $5m initial capitalisation for the state health insurance fund, plus continued support of the low-income premium subsidy after the end of 2016.

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‘God gave me this big family’

Centuries-old social traditions and poverty have trapped Chad in a cycle of high birth rates and high mortality

By **Andrew Jack** in Lake Chad
Photographs by **Kate Holt**

Malngaye Adam grimaces as he squats on a mat in a hot, dusty compound in Tagal, a village of one-storey mud and wooden houses on the shore of Lake Chad. “Life has become very difficult,” he says, flanked by his wife and 10 children.

In the country’s southwestern Lac region, flooding, raids by radical Islamic Boko Haram militants — and government-forced displacement in response — have squeezed the amount of land he has to cultivate. Drought has reduced his crop of maize to a fraction of previous levels. A recent influx of refugees from neighbouring Nigeria — and the accompanying aid workers — has pushed up food prices.

He glances round at his nine boys and single girl, unable to recall their precise ages, and says he cannot afford to pay the fees to send any of them to school. “It’s a matter of pride to have a big family,” he says. “Lots of children help you. It was not my choice. God gave them to me.”

He married his wife, Kattouma, when she was 15 and he was 22. He is now 52. “If she had given me only two children, I would have taken a second wife — if I’d had the money,” he says with a smirk. But, as she breastfeeds her nine-month-old youngest, Kattouma says firmly that she has had enough children and would have used contraception had she known about it earlier.

Their situation is typical in Chad — one of the world’s poorest countries with the fourth highest fertility rate. With an average of nearly seven children per mother — and rising — the country defies the typical global pattern of so-called “demographic transition”. Normally, improved health and development reduces early deaths and a fall in birth rates follows, resulting in a balanced population for each age group.

The population of Chad, however, is around 13m and growing at 3.5 per cent a year, with two-thirds of its people aged under 25. Without greater efforts to limit this expansion, experts warn that Chad risks missing out on the “demographic dividend” — a surge of people entering the workforce to boost economic growth.

A matter of pride
Malngaye Adam, right, with his wife Kattouma and their 10 children in the village of Tagal in the Lake Chad basin

Instead, rising overall numbers of young dependents in Chad are exacerbating health and nutrition problems, triggering conflicts and forcing communities to spread any gains very thinly at the expense of improved services.

"I tell heads of state that the best asset they have is their people," says Babatunde Osotimehin, a former health minister of Nigeria and now executive director of the UN Population Fund, which is active across the region in promoting improved family planning. "Young people can transform societies, but if you have so many it's not sustainable."

In Tagal, a two-hour drive from the Lac region's capital of Bol along rugged desert tracks more often used by camels and long-horned cattle than cars, traditional practices prevail. The local chief, Ali Koura, preaches the merits of "family limitation" and says that five or six children are sufficient, although he has 13 by five wives.

In a nearby walled compound of huts, Ashta Mohammed, now aged 22, says she was forced by her parents to marry at 14 and had the first of her four children within a year. "I suffered a lot," she recalls of the birth, saying she would now like to pause for three years. But she sees herself eventually having a family of at least eight. "[Having] lots of kids will help me."

In Africa's fifth-largest country, which sits on significant oil reserves, some pronatalists argue there ➤

1.

'This is an insular population living precariously, in ignorance, with no education or health infrastructure'

2.

is no need for birth control, with plenty of land to go round. The different tribes and faiths vie for influence and are concerned about security, with hostile neighbours across the largely uninhabited northern and eastern sub-Saharan desert regions, including Libya and Sudan.

Most of Chad's population is concentrated in pockets of the west and the more verdant south, where rising fertility rates are driving malnutrition and unnecessary deaths of mothers and infants as well as creating environmental pressures such as over-fishing and farming and desertification of agricultural land. As resources are squeezed, periodic conflicts break out.

"Things have become difficult," says Mohammed Kale, one of Tagal's many fishermen. "There is less water and too many people are fishing. Ten years ago there were plenty of fish. Now I catch a sixth as much and most of them are smaller. I'm only 40 years old, but I have grey hair from the stress of looking after my eight children."

In Bol, Youssef Mbodou Mbami, Chad's former ambassador to Niger and Nigeria who has returned to his roots as the traditional leader for the region, points to long-standing but intensifying feuds linked to nomadism and transhumance (the moving of cattle in search of pasture). "The number of people has increased but the space is the same. There are tensions between farmers and cattle herders. Everyone wants land," he says.

1. Youssef Mbodou Mbami, the traditional chief of the Bol region
2. and 3. Fishermen at work on the lake by the village of Tagal, where resources are under increasing pressure

3.

His family has provided leaders in the region for six generations. He himself has 15 children, and he stresses underlying causes in the isolated, landlocked country that help account for unrest and high fertility."This is an insular population living precariously, in ignorance and with no education or health infrastructure," he says.

The neglect of the population's social needs reflects both the legacy of 60 years of colonial rule by the French and half a century of instability and conflict since independence in 1960. Long before the displacements triggered by the rise of Boko Haram in the past three years, military and security activities dominated government.

Foreign powers, with an eye on containing Islamic extremism, have also focused on Chad's strategic importance, ignoring the need for domestic reform. There is a large French military base near the airport in the capital N'Djamena and a new multistorey, fortress-like US embassy is being constructed on the outskirts.

Health accounts for less than 7 per cent of the state budget and, with most people required to pay out of their own pocket even for nominally free public services, total spending on health was just 3.6 per cent of gross domestic product in 2014, according to the World Bank, compared with 17.1 per cent in the US and 8.8 per cent in South Africa.

This lack of investment helps explain both the high rates of infection and death and the scant use of family planning. Supply and demand for modern forms of contraceptives are among the lowest in the world, with surveys suggesting they are used by less than 5 per cent of women in Chad. ➤

'The culture remains impenetrable. People think of girls as women as soon as they reach reproductive age'

More indirect ways to lower fertility are also absent. Literacy for girls is at 20 per cent and just 12 per cent even start secondary school. Instead, nearly 68 per cent are married before the age of 18 and 29 per cent before they reach 15, according to Unicef. Girls begin giving birth while they are still physically immature, leading to complications such as obstetric fistula (internal tearing during childbirth that leads to incontinence). They then face a long reproductive cycle, often marked by inadequate spacing between births, and the inability to produce sufficient breast milk to feed their children.

"Here, the woman has no power," says Bakary Sogoba, head of child protection for Unicef in Chad, drawing a contrast with neighbouring countries that have lower fertility rates. "In Mali, there is a long tradition of travel. Chad is less open to the exterior. The culture remains impenetrable. People think of girls as women as soon as they reach reproductive age — they are sometimes even promised to a boy at birth. And where there is polygamy, you can have competitive reproduction between multiple wives vying to have more children than their rivals."

"There is progress, but it's not enough," says Moussa Khadam, Chad's minister of public health, whose grandfather had 63 children but who has limited himself to two. "Chad has very high illiteracy and is already overpopulated in the centre and the south. We need better tools for family planning and greater awareness to tackle traditions that are centuries old."

When public money is provided, however, it is not always used effectively. Behind Khadam's ministry building in N'Djamena are more than 100 unused ambulances neatly parked among growing weeds; none of them even has a number plate. Even if they are eventually deployed as intended, and do not quickly break down on the country's few passable roads, many see them as a wasted investment.

Rolland Kaya, country manager for the Médecins Sans Frontières humanitarian aid mission in Chad, argues that much more public funding should go into supporting basic prevention methods and local health clinics. "Often there are no supplies, no vaccines, no bed-nets against malaria, no hygiene training to stop infection, and workers are not paid," he says.

The result is that people turn instead to traditional healers, whose interventions often make matters worse. He cites strange herbal concoctions, incisions made into the skin as supposed treatments and, in one case, a remedy for diarrhoea that involved burning the affected young child's anus.

Mortality rates in Chad

856

maternal deaths per 100,000 live births

139

deaths of children under five per 1,000 live births

Such practices explain why Chad ranks among the world's worst performing countries in terms of health. With maternal deaths of 856 per 100,000 live births in 2015, and infant deaths of 85 per 1,000 live births, life expectancy at birth is just 53.1 years. In part, the country has not experienced the demographic transition because many of the pre-determinants are not yet in place. Having more children remains a way to replace those who do not survive.

At a therapeutic feeding centre in N'Djamena, Nelkam Dadimra, who is barely 15, cuddles her malnourished 10-month-old daughter, Salut. She came to the capital three years ago to find work as a cleaner and gave birth at home, leading to complications and stomach pains from which she still suffers. Unable to breastfeed, she fed her child a millet porridge made with water which she is too young to digest. This has caused diarrhoea and fever. "God gives us children," she says. "Maybe I will have 10."

With malnutrition affecting 40 per cent of Chad's children, Dr Ibrahim Dicko, who runs the centre, says he

'In rural areas, practically nothing is being done. We are going backwards'

1.
Girls use the waters of Lake Chad to do the washing

2.
Nelkam Dadimra, 15, with her 10-month-old daughter at a therapeutic feeding centre in N'Djamena

sees such cases frequently. One reason is the extremely low use of exclusive breastfeeding by mothers, partly because of a belief that if either mother or child is ill, breast milk will be harmful. "They give herbs, ashes, buy powdered milk and mix it with water," he says. "Gastroenteritis is very common."

While most of the 100 children currently being treated at the feeding centre need at least seven days' care, Dr Dicko says mothers sometimes take them home sooner while they are still ill, or even abandon them. "Husbands want their wives at home, and there is family pressure to look after the other children. They think they can always have more."

At a family planning clinic in N'Djamena's main market, where women can slip in discreetly while selling or shopping, Josephine Nangtan, a counsellor, gestures towards a box on her desk containing dozens of registration cards. "They ask me to keep them here, because if their husband sees them, it could be a reason for violence or divorce," she says.

Attitudes are beginning to change. Protestant Church leaders support contraception — not to limit family size but to stress the need for a "responsible" number of healthy children, starting later and spacing births. The Catholic Church takes a similar line, while stressing it only encourages natural methods. The same is true of Muslim leaders. Sheikh Abdaddayim Ousman, secretary-general of the Higher Council on Islamic Affairs, says: "The prophet told us to marry and have a family of quality, not quantity. Islam also distinguishes between marriage and the consummation of marriage."

On paper, at least, legislation passed in 2002 guarantees access to reproductive health in Chad, overturning colonial-era laws that banned birth control and widespread practices that, until far more recently, required husbands or parents to authorise any family planning. An official plan has set four children per woman as an objective for the country by 2030.

More radically, last year President Idriss Déby Itno pushed through a law banning marriage before the age of 18 — a first in west Africa and a move possibly linked to his current international profile as the chair of the African Union. Khadam, the health minister, says some violations have already been prosecuted.

Yet for now, as Abbot Gabriel Dobade from the Catholic Church's Episcopal Conference, puts it, there are few signs of broader public investment in Chad's development. "In rural areas, practically nothing is being done," he says. "We are going backwards in areas where we should be advancing. There is injustice and poor governance."

After years of rising government revenues, the drop in the oil price in recent months has imposed fresh austerity. The conference centre where the African Union was supposed to hold its meeting in N'Djamena last year sits unfunded and unfinished. Public sector workers and students on grants have not been paid in weeks, triggering marches, strikes — including in health centres — and stone-throwing by young people.

Just as the state's ability to invest in health, family planning and other public services has been reduced, the most recent swelling cohort of young people is moving towards adulthood and is beginning to make its frustration felt. ●

‘Child marriage harms our human family’

Girls should be free to flourish on their own terms, says **Desmond Tutu**

Millions of girls are married as children. This fact harms our human family and reminds us how deeply biased our world still is against mothers, sisters and daughters. We now have a moral duty to end one of humankind’s most destructive traditions. Experts say it is feasible in one generation.

Maybe because I am a man, I have spent much of my life ignorant of the scale and awfulness of child marriage. But, in recent years, I have talked to many girls and women who have educated me. It wasn’t until my retirement that I realised that one in three women in the developing world is married before the age of 18, or understood what they risk as a result.

Across the world, girls are powerless to choose when they marry, to whom, or whether they marry at all. The day of their marriage is the day they give up school. Under pressure to bear children, they cannot negotiate safe or consensual sex. As pregnant young mothers, they face the danger of injury and death. Indeed, childbirth is one of the biggest killers of teenage girls in the developing world — and their children face the same tragic odds.

‘Traditions were made by people; they can be changed by people’

Marrying a girl young, often to a much older man, is a sure way to inflict poverty and inequality in her community. But there is an alternative: to end this cycle is to free a girl to be safe and healthy — to let her flourish and become who she wants to be, on her own terms.

Five years ago, I organised a meeting with The Elders, an international organisation of former politicians, public figures and other oldies like me, to ask child marriage activists what we could do to help. They told us to speak out, that real change needed to happen at the grassroots. They said a movement was needed.

Today it is obvious they were right. Now standing behind those activists — mothers, daughters, fathers, sons, teachers, imams, priests, rabbis — are countless communities determined to break the painful bondage of tradition. We helped them build a coalition, Girls Not Brides, which spans more than 80 countries and 600 organisations. Hillary Clinton, then secretary of state, told me she has made ending child marriage her personal commitment.

There has been heartening progress. Last year, the UN made gender equality one of its Sustainable Development Goals for 2030. In 2014, the African Union launched a continent-wide campaign to end child marriage, encouraging its 54 member states to pass laws, make action plans and support communities.

In Nepal, a national plan to end child marriage involved ministries, local and foreign non-governmental organisations, academics, law enforcement, journalists, and faith and community groups. The result was a committed national movement with the spirit and vision to get the job done. We are dealing with deep-rooted traditions: it is everybody’s job to help. As my friend Graça Machel [the politician and widow of former South African president Nelson Mandela] says: “Traditions were made by people; they can be changed by people.”

Even with better recognition, the problem continues to grow. The number of child brides rises each day. This year alone it will wrench 15m girls out of childhood.

The biggest challenge is to accelerate change in towns, villages and homes. The activists I have met — in Ethiopia, India and, more recently, Zambia — are hard at work convincing parents and communities that there are alternatives to child marriage. But many of them don’t have the funds to match their courage. They deserve far more support. With support, these girls will win back their freedom: in Zimbabwe, Loveness and Ruvimbo, two young women forced to wed before they were 18 took their government to court. Child marriage is illegal there unless parents allow it, which their parents did. Zimbabwe’s Constitutional Court ruled in the girls’ favour, bringing all of its children’s rights closer to the full protection of the law.

I know that one generation sounds like a short time to turn the tide on a practice that is centuries old, but that is why old ones like me are here to remind you that change is in the air. If two brave girls refused to give up, neither can any of us. ●

Archbishop Desmond Tutu received the Nobel Peace Prize in 1984 and is a champion of Girls Not Brides: The Global Partnership to End Child Marriage

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