Prematurity: The hidden burden in reproductive health

BORN TOO SOON

One out of every ten babies around the world is born prematurely i.e. before reaching 37 weeks of gestation. Prematurity is the most common cause of both neonatal deaths and deaths of children under-5\(^i\). Preterm birth is a critical health challenge because of this high rate of deaths and the long-term disabilities that are common among survivors.

WHY SOME BABIES ARE IN A HURRY?

Preterm birth can be either provider-initiated or spontaneous. In many cases, provider-initiated preterm birth is necessary due to obstetric or fetal indications. However, in the United States there is evidence that more than half of provider-initiated preterm births at 34-36 weeks gestation were carried out in absence of a strong medical indication\(^i\). Significant differences in rates of caesarean, induced, and spontaneous onset of labour are also found among European countries\(^ii\), implying that a similar trend of intervening in labour without an important medical reason might be the case in Europe as well.

The cause of spontaneous preterm births is unidentified in almost 50% of the cases. Maternal history of preterm birth is a strong risk factor\(^iii\). Other maternal factors associated include young or advanced maternal age, short inter-pregnancy intervals, low maternal body mass index\(^iv\), and multiple fetuses. The latter carry nearly 10 times the risk of preterm birth compared to singleton births\(^v\). The increasing availability of assisted conception in high income countries has contributed to the increase of births of twins and triplets. England and Wales, France and the United States reported 50-60% increases in the twin rate from mid-1970s to 1998\(^vi\). Urinary tract infections, malaria, bacterial vaginosis, HIV and syphilis are all associated with preterm births\(^vii\). Lifestyle factors that also contribute to preterm births include stress and excessive physical work, long times spent standing, smoking, excessive alcohol consumption, periodontal disease. Obesity, diabetes, and hypertension are likely to become important contributors to global preterm birth.

Preterm birth can be divided based on gestational age:
- Extremely preterm (less than 28 weeks)
- Very preterm (between 28 and 32 weeks)
- Moderate preterm (between 32 and 37 weeks, which can be further split to focus on late preterm birth between 34-37 completed weeks)

PREMATURITY IN NUMBERS

- 15 million preterm babies globally every year
- 60% in sub-Saharan Africa and South Asia
- 1 million babies die as a result of prematurity
- Leading cause of death during first month of life
- Leading cause of death for children under five
- 75% of deaths preventable without the need for intensive care
- 10 times higher medical costs during 1st year of life for preterm than for term infants (USA)

SURVIVAL GAPS AROUND THE WORLD

The overwhelming gaps and inequalities among countries in general, maternal, and reproductive health, are also present in preterm survival and care. High income countries (HIC) with sophisticated health systems, including neonatal intensive care facilities, can achieve a 50% chance of survival even in extremely preterm births at 24 weeks of gestation. In low and middle income countries (LMIC) this chance of survival is achieved only for moderate/late preterm births on the 34th week and onwards.

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<th>% of survival in HIC</th>
<th>% of survival in LMIC</th>
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<tr>
<td>25 weeks</td>
<td>=50%</td>
<td>≈ 0%</td>
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<tr>
<td>28-32 weeks</td>
<td>95%</td>
<td>30%</td>
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<tr>
<td>34-37 weeks</td>
<td>above 95%</td>
<td>above 50%</td>
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The good news is that extremely preterm births which require intensive care represent only 5% of premature babies, and very preterm births another 10%. Over 80% of preterm births occur relatively late, between 32-37 weeks of gestation, and most infants can survive only with essential newborn care. However, in LMIC a lot of those babies still die needlessly due to poor health and maternal facilities. And despite the assumption that preterm survival is associated with advanced and costly healthcare facilities, the history of neonatal care in HIC shows that the major reduction in preterm deaths occurred before neonatal intensive care was established\(^ix\).
PRIORITIES FOR ACTION

The Global Action Report on Preterm Birth sets two priorities that shall guide actions taken to deal with prematurity:
1. Close the survival gap for preterm babies in lower income countries by implementing improved obstetric and newborn care.
2. Develop innovative solutions to prevent preterm birth all around the world.

With regards to the second priority, the absence of a solid knowledge on the causes that can lead a pregnancy to a preterm birth is a major obstacle, especially for the prevention in HIC. In that respect, more rigorous research and data are necessary in order to close the knowledge gaps.

On the other hand, existing evidence-based interventions can have an immense impact in reducing mortality in LMIC, closing the survival gap among countries. The key for that is the integration and delivery of the interventions within the continuum of reproductive, maternal, neonatal and child health (RMNCH)1.

PRECONCEPTION CARE

Care before pregnancy or preconception care includes “any intervention provided to women and couples of childbearing age, regardless of pregnancy status or desire, before pregnancy, to improve health outcomes for women, newborns and children”15. It is a relatively new concept in the prevention of preterm birth.

Preconception care is cost-effective since most of the interventions are not only relevant to prematurity but are part of the Sexual and Reproductive Health and Rights’ (SRHR) agenda.

<table>
<thead>
<tr>
<th>SRHR-related risk factors</th>
<th>SRHR-related interventions</th>
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<tr>
<td>Pregnancy in adolescence</td>
<td>Access to contraception, sexual education</td>
</tr>
<tr>
<td>HIV, syphilis, other STIs</td>
<td>Access to SRH information and services</td>
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<tr>
<td>Short spacing between pregnancies</td>
<td>Access to family planning information and services</td>
</tr>
<tr>
<td>Violence against women and girls</td>
<td>Combat violence against women and domestic violence</td>
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Risk factors that are associated with an increased risk of preterm birth include:
- Infectious diseases, including STIs, especially syphilis and HIV
- Pregnancy in adolescence; adolescent girls are at disproportionately greater risk of having premature and low-birthweight babies compared to women 20-35
- Poor mental health and intimate partner violence
- Tobacco use; cigarette smoking approximately doubles the threat of preterm birth
- Chronic diseases, particularly diabetes and hypertension
- Birth spacing; spacing pregnancies between 18-24 months is ideal to replenish nutritional reserves

Most of the above risk factors can be addressed with the same tools that SRHR community advocates for. Appropriate sexual education, access to contraception and birth control, access to regular screening and treatment for STIs—particularly syphilis and HIV/Aids, and elimination of violence against women can spearhead in preconception care to reduce prematurity. Other efficient interventions include smoking-cessation campaigns, screening and management of chronic and mental diseases.

Preconception care was the latest ‘entry’ in the continuum of RMNCH care, which used to focus almost exclusively in the pregnancy and post-birth periods in order to improve maternal and newborn health. However, preconception offers the unique opportunity to reduce risks, so that women can enter pregnancy in the best possible health, hence increasing the chance of delivering a healthy baby and avoiding, among others, prematurity.
CARE DURING PREGNANCY

Preventing preterm birth, or in case this cannot be accomplished reducing preterm mortality, depends critically on the access to and quality of antenatal care. Care during pregnancy is an essential element of reproductive health and of the global effort to achieve MDG 5 on reducing maternal mortality.

A basic package of recommended antenatal care services specifically for the prevention of prematurity includes:

- identification of women at high risk
- identification and correction of malnutrition and nutrition counseling
- counselling on birth preparedness and complication readiness for identification of early labour and other risk factors
- screening and treatment of STDs and other infections
- behavioral and social support interventions (ceasing smoking, prevention of violence against women)

The latter two interventions are also part of the pre-conception care.

On a legislative level, interventions relevant to antenatal care include:

1. Universal access to quality maternal and perinatal services, with a special focus on socially vulnerable women
2. Protective legislation to improve general working conditions and eliminate the exposure of women in harmful environments, like secondhand smoking, and excessive physical work.

There is also a number of evidence-based interventions specifically for pregnant women in high risk of preterm delivery, that can improve health outcomes in the premature baby with the most prominent being antenatal corticosteroids; achievement of universal coverage across the 75 Countdown to 2015 priorities countries would result in an approximate 40% decrease in preterm-associated mortality in 2015 - around 370,000 deaths averted per year in comparison to 2010.xii

However, according to the largest WHO study on the use of corticosteroids, conducted mostly in LMIC, only 52% of women who gave birth preterm in hospitals have received steroid injections which prevent not only death but disability among vulnerable, preterm newborns. These drugs have existed for decades, don’t require refrigeration, and cost less than US$ 1 an injection.xiii

Preterm babies’ lungs are often not fully developed and they can have breathing problems soon after birth. An injection of corticosteroids given to a mother in preterm

<table>
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<tr>
<th>CARE DURING PREGNANCY</th>
<th>ALL WOMEN</th>
<th>WOMEN AT HIGH RISK</th>
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<tbody>
<tr>
<td>MEDICAL LEVEL</td>
<td>Provision of basic antenatal care</td>
<td>Access to key interventions, such as antenatal corticosteroids</td>
</tr>
<tr>
<td>POLICY LEVEL</td>
<td>Lower caesarean birth and early induction rates for non-medical reasons, Smoking cessation programs</td>
<td>Special care in adolescent pregnancies, infertility treatments should limit the number of embryos transferred</td>
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<tr>
<td>LEGISLATIVE LEVEL</td>
<td>Universal access to maternal services Workplace policies for healthy pregnancies</td>
<td>Eliminate user fees for access to maternal health care services for women from poor background</td>
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labour or at risk for preterm birth triggers production of surfactant (a protein substance produced by lung cells to facilitate breathing) in the baby’s lungs. It is known to be the most effective intervention to reduce the risk of respiratory distress syndrome among preterm babies born in hospitals where access to further newborn care is available.

**CARE FOR THE PRETERM BABY**

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<th>Context</th>
<th>Number of preterm babies</th>
<th>Facilities</th>
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<tr>
<td>High-income countries</td>
<td>1.2 million</td>
<td>Full intensive care</td>
</tr>
<tr>
<td>Middle-income countries</td>
<td>3.8 million</td>
<td>Neonatal care units</td>
</tr>
<tr>
<td>Low-income countries</td>
<td>10 million</td>
<td>56% home births, 44% facility births</td>
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<td></td>
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<td>with limited space, staff, equipment</td>
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The chance of survival for the preterm infant depends not only on the level of prematurity, but mostly on the place of birth. In HIC, advanced neonatal intensive care facilities have pushed the gestational age baseline for survival to extreme low. However, in LIC survival of moderate-preterm babies at 34 weeks is still a challenge.

Though the prevention of preterm birth per se is primarily a knowledge gap, the lack of the appropriate care for preterm babies is primarily an action gap. Limited resources and lack of maternal and neonatal facilities in LMIC play a crucial role on that. More than 60% of all premature babies are born in South Asia and sub-Saharan Africa, with just over half now being born in facilities. Most preterm births occur after 32 weeks of gestation (84%) and deaths in these babies can almost all be prevented by essential newborn care.

Evidence-based interventions for the premature baby include:

- **Package 1:** Essential and extra newborn care; care at birth from a skilled provider, basic thermal care and feeding support, infection prevention adopting hands cleansing and other basic hygienic practices.
- **Package 2:** Neonatal resuscitation; basic resuscitation through use of a bag-and-mask or mouth-to-mask will save 4 out of every 5 babies who need it.
- **Package 3:** Kangaroo Mother Care (see box)
- **Package 4:** Special care of premature babies and phased scale up of neonatal intensive care (care for signs of infection, jaundice, respiratory distress syndrome).

With the exception of the 4th package, the above-mentioned interventions are relatively simple and cost-effective. With special regards to the 50 million home births without skilled care – 10% of them are preterm, community mobilisation to ensure parents’ and family’s awareness on the essential newborn care is critical. Promoting early and exclusive breastfeeding, basic hygienic practices during labour, and providing thermal care to the newborn with simple interventions such as increased environmental temperature and covering the baby’s head with a knitted cap, are crucial for every newborn, but for preterm babies can be life-saving.

**THE KANGAROO MOTHER CARE (KMC)**

KMC is an example of innovative and cost-effective intervention to reduce premature mortality, developed in Colombia. The preterm baby is put in early, prolonged, and continuous direct skin-to-skin contact with her mother or another family member. KMC is associated with significant reductions in neonatal mortality, infections and hypothermia for stable babies weighing less than 2 kg if started in the first week. Other positive outcomes include increased breastfeeding, weight gain, mother - baby bonding. KMC is parent-, baby- and health system-friendly, as it reduces hospital staying. Endorsed by the WHO, KMC is a medical innovation that should also be applied in HICs. Regretfully, it is underutilised, despite the sound evidence for its effectiveness. Lack of knowledge by policy-makers and service-providers are essential barriers.

**PREMATURITY BEYOND SURVIVAL**

Europe’s rate of prematurity approaches the global one; approximately 1 in 10 newborn, which translates to some 500000 preterm babies. Though in the European context survival is not a critical issue as in LMIC, prematurity has also a usually forgotten aspect; an increasing risk of disability/impairment.
Adverse effects can range from school learning disability to brain injuries, while there is an increasing evidence of a link with non-communicable diseases in later adult life. Thus, addressing prematurity goes beyond survival.

There are wide differences in the prevalence of preterm birth between European countries, ranging between 5-14% of total births. Preterm infants represent Europe’s largest child patient group.

As neonatal intensive care facilities have pushed the gestational age ‘limits’ of survival to extreme low, neonatal mortality decreases in most European countries, and more preterm infants survive.

Prematurity sets a long-term social and economic challenge, since preterm children are at greater risk of health, learning and behaviour problems, such as cerebral palsy, attention deficit disorders, pulmonary infections, and asthma; potentially increasing the risk for chronic obstructive airways disease, chronic heart disease, and psychiatric disease in adulthood.

Longterm morbidity is an important financial burden to families, healthcare systems, and societies. One striking example of the societal costs of preterm birth is the incidence of cerebral palsy. The lifetime costs of this illness are estimated at a minimum of €750000 per child. In the USA, the annual cost estimate for preterm birth based on 2005 figures is $26.2 billion.

Up to 10% of preterm infants suffer from medical disability that will affect their working capacity by more than 50%. Many mothers of preterm infants who intended to return to work after the birth either postpone doing so, reduce their hours, or leave the workforce altogether to care for their child. This is usually associated with a reduction in family income of up to 32%.

Though until recently prematurity was seen as a potential problem for cases before the 36 gestational week, leaving out of the picture late preterm births, research findings have demonstrated that even in those cases, there is an increased risk of morbidity.
Over the past years in HIC there has been major efforts to reduce the rate of early elective deliveries, particularly in the USA where the phenomenon is more widespread. Early births without medical reason, using either induced labour or caesarean section are also associated with short- and long-term health problems for the newborns.

“It used to be that a woman who had reached 37 weeks had crossed the goal line. The goal line has moved.”
Dr. Edward McCabe, Chief Medical Officer at March of Dimes

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It’s important that women who have a real medical reason for delivering early aren’t scared off from doing that. But for everyone else, giving the baby an "extra edge" of the last few weeks is very important. Each earlier week of preterm birth almost doubles the morbidity risk during the neonatal period.

For 38 gestational weeks it is 3,3%, for 37 is 5,9%, for 36 is 12,1%, for 35 is 25,6%. The risk of a disability permanently reducing working capacity by 50% is twice as frequent in moderate and late preterm survivors compared with full term births, and increases 7-fold in extremely preterm survivors.

WHITE PAPER AND 13 KEY RECOMMENDATIONS
The European Foundation for the Care of Newborn Infants (EFCNI) is a pan-European organisation and network to represent the interests of preterm and newborn infants and their families. It gathers together parents, healthcare experts from different disciplines and scientists with the common goal of improving long-term health of preterm and newborn children by ensuring the best possible prevention, treatment, care and support. EFCNI published the first White Paper on Maternal and Newborn Health and Aftercare Services, Caring for Tomorrow, with 13 key recommendations:

1. Recognize the issues of maternal, newborn care and aftercare as a public health priority, particularly the health of preterm infants and infants with illnesses
2. Acknowledge the potential long-term consequences of preterm birth and for newborns with illnesses that need to be tackled
3. Address health inequalities in maternal and newborn care within all European Member States
4. Conduct national audits on maternal, newborn care and aftercare services and establish a multidisciplinary task force for developing national best practice guidelines
5. Implement national policies and guidelines for high-quality pre-conceptional, maternal and newborn care and aftercare. These policies and guidelines should include the principles highlighted in this White Paper
6. Provide equal and early access to full and true information, education and counselling
7. Harmonise education and training of health care providers
8. Provide social and financial support to parents and families
9. Develop and implement strategies for public awareness and education
10. Harmonise cross-border maternal and newborn healthcare
11. Monitor outcomes and implement audit procedures in maternal, newborn and aftercare
12. Implement European wide standardised datasets for pregnancy and preterm birth outcome
13. Invest in comprehensive research to tackle the challenge of preterm birth and its potential long-term consequences.
The founding of the Interest Group on Maternal and Neonatal Health in the European Parliament in May 2011 by German MEPs Dr. Angelika Niebler and Dr. Peter Liese manifest also the increasing visibility of prematurity as a primal public health issue in EU. The group brings together a diverse number of MEPs who are concerned with the issues of preterm birth and maternal health in Europe, seeking to mainstream the issue of maternal and neonatal health within all relevant EU policies and initiatives. The interest group collaborates closely with EFCNI.

Prematurity is gradually gaining the visibility it deserves as a global health issue in the broader area of maternal, neonatal and children's health. Born Too Soon, the Global Action Report on Preterm Birth was written in support of the Global Strategy for Women's and Children's Health and the efforts of the UN Secretary General's Every Woman Every Child movement. The Global Report set a two-fold global goal by 2025 for the reduction of deaths due to complications of preterm birth:

- For countries with a current neonatal mortality rate of more than or equal to 5 per 1000 live births (mostly LMIC), to reduce the mortality due to preterm birth by 50% compared to 2010
- For countries with a current neonatal mortality of less than 5 per 1000 live births (most HIC), to eliminate preventable preterm deaths, focusing on equitable care for all and quality of care to minimise long-term impairment.

Every Newborn Action Plan builds on Every Woman Every Child, and was developed by WHO and Unicef in response to country demand. It sets out a clear vision of how to improve newborn health and end preventable newborn deaths and stillbirths. Progress towards the achievement of the global goal and targets will be monitored and reported periodically to the Health Assembly.

The Global Alliance to Prevent Prematurity and Stillbirths (GAPPS) is leading a collaborative effort to increase awareness and accelerate innovative research and interventions that will improve maternal, newborn and child health outcomes around the world.

As shown in this Intelligence Brief, the tools to meet the above goals exist. Whether they will be achieved depends critically on whether appropriate interventions will be integrated in the existing health systems; Prematurity is a leading cause of newborns’ mortality. Addressing it effectively presupposes that we acknowledge the issue as an integral challenge in the continuum of reproductive, maternal, neonatal and child health, so that the right policies can be put in place.

Acknowledgements

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