**////Title: Strategies to Ensure the Worldwide Elimination of Tetanus in Mothers and Neonates**

////Standfirst: The potentially fatal impact of tetanus on mothers and infants is a serious issue in developing countries. Dr Syed Ahsan Raza at Baylor College of Medicine and Dr Bilal Avan at the London School of Hygiene and Tropical Medicine have recently published their perspectives and insights into this important issue.

**////Bodytext:**

Tetanus is a serious, potentially fatal disease of the nervous system characterised by severe stiffness, muscle spasms and breathing difficulties. It is caused by Clostridium tetani bacteria (usually found in soil) entering the body, often through a wound or cut, with highly potent neurotoxic effects. In some developing countries, tetanus unfortunately still occurs and presents a significant healthcare challenge, despite being preventable through vaccination for decades.

A particular difficulty in developing countries is the contribution of tetanus to maternal and neonatal (newborn) deaths. In mothers, an infection can occur following miscarriage or abortion and is often associated with unclean and unhygienic delivery of the infant. In newborns, bacteria can enter the body through the umbilical stump, where the umbilical cord connecting the infant to the mother has been cut following birth. Unhygienic delivery practices can also cause tetanus infection through this route, and inadequate care of the umbilical stump poses a specific risk.

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In 2019, Dr Syed Ahsan Raza at Baylor College of Medicine and Dr Bilal Avan at the London School of Hygiene and Tropical Medicine published their insights into challenges of maternal and neonatal tetanus and critically, their perspectives on how these might be overcome in the developing world.

Dr Raza and Dr Avan note that targets to eradicate neonatal and maternal tetanus by 2020 have unfortunately failed in 14 countries. These include Afghanistan, Angola, Central African Republic, Chad, Congo, Guinea, Mali, Nigeria, Pakistan, Papua New Guinea, Somalia, Sudan, South Sudan and Yemen.

In explanation of this, Dr Raza and Dr Avan point to the lack of adequate immunisation in some countries, along with unclean delivery services and inappropriate umbilical cord care. The majority of neonatal tetanus deaths occur in countries within sub-Saharan Africa and South Asia – areas where poverty is rampant.

In such areas, access to quality antenatal health care can be extremely limited or even non-existent for mothers. Many births happen in the family home (rather than a hospital, for example), and there is typically a shortage of appropriate information available about safe, clean delivery practices.

The upshot is that the fatality rate of neonatal tetanus can be extremely high in cases of home delivery or where deliveries are not carried out in proper health care facilities. It should be noted as well that birth and death data are not always recorded, making it difficult to assess the true scale of the difficulty.

Dr Raza and Dr Avan argue that in addition to poverty, marginalised and displaced populations (such as Afghan refugees in Pakistan) are at risk of inadequate vaccination and insufficient healthcare information. Furthermore, in some areas, traditional attitudes may still prevail in which deaths from neonatal tetanus are viewed as the wish of God and immunisation campaigns may be met with suspicion. Dr Raza and Dr Avan also note that natural disasters, armed conflicts, and politically motivated fake vaccination programs have further disrupted global prevention and elimination strategies of childhood vaccine-preventable diseases, including neonatal tetanus.

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Dr Raza and Dr Avan explain that there are two main strategies for eliminating neonatal and maternal tetanus. The first is immunisation. Here, the approach most commonly used is the routine immunisation of pregnant women in which the aim is to deliver two doses of tetanus toxoid 1 month apart. An approach known as ‘supplementary immunisation’ is employed in areas deemed to be such high risk for neonatal tetanus that the first approach described may not be effective. This involves making vaccination available beyond standard provision by utilising schools and other community-based settings. To this end, Dr Raza and Dr Avan have called for the support of supplementary immunisation to be increased.

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The second elimination strategy for maternal and neonatal tetanus is improving birth hygiene and practising clean deliveries. In 1988, the World Health Organization published a review of the evidence in support of appropriate care of the umbilical cord. They also summarised clean delivery and cord care practices, referring to these as the ‘six cleans’.

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It is clear that, along with increased vaccination, the existing high neonatal mortality rates in developing countries due to neonatal umbilical cord infections can be effectively reduced by adopting the ‘six cleans’ approach.

For this reason, the World Health Organization has endorsed the supply of clean birth kits in resource-poor settings for many decades. The kits consist of sterilised disposable packages to facilitate the ‘six clean’ practices, which are, namely:

(1) plastic delivery sheet for clean surface

(2) a soap to ensure clean hands and (3) perineum

(4) a blade for clean cutting of the umbilical cord

(5) cord ties/ligand for clean tying of cord, and finally

(6) gauze and spirit for clean post-delivery cord care.

Dr Raza and Dr Avan note that scarcity of the supplies required to ensure the six cleans approach is adhered to remains a difficulty in some settings. Additionally, they note that behavioural change is also required to ensure the six cleans approach is adhered to and is considered culturally acceptable.

In conclusion, Dr Raza and Dr Avan show that while the use of these cost-effective kits can reduce the incidence of neonatal and maternal infections, research is required to confirm the extent of the benefits.

Looking to the future, Dr Raza and Dr Avan also argue that for countries that are already planning to promote clean birth kits or add new contents, it will be crucial to collect data on the experiences of the personnel and mothers involved, e.g., the implementation techniques and impact of these, as well as the associated costs.

This SciPod is a summary of the paper ‘Eliminating Maternal and Neonatal Tetanus and Promoting Clean Delivery Practices Through Disposable Clean Birth Kits’ from the open access journal, Frontiers in Public Health. DOI: https://doi.org/10.3389/fpubh.2019.00339

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