Tetanus disease and deaths in men reveal need for vaccination
Shona Dalal,a Julia Samuelson,a Jason Reed,b Ahmadu Yakubu,b Buhle Ncubea & Rachel Baggaleyab

Abstract With efforts focused on the elimination of maternal and neonatal tetanus, less attention has been given to tetanus incidence and mortality among men. Since 2007 voluntary medical male circumcision has been scaled-up in 14 sub-Saharan African countries as an effective intervention to reduce the risk of human immunodeficiency virus (HIV) acquisition among men. As part of a review of adverse events from these programmes, we identified 13 cases of tetanus from five countries reported to the World Health Organization (WHO) up to March 2016. Eight patients died and only one patient had a known history of tetanus vaccination. Tetanus after voluntary medical male circumcision was rare among more than 11 million procedures conducted. Nevertheless, the cases prompted a review of the evidence on tetanus vaccination coverage and case notifications in sub-Saharan Africa, supplemented by a literature review of non-neonatal tetanus in Africa over the years 2003–2014. The WHO African Region reported the highest number of non-neonatal tetanus cases per million population and lowest historic coverage of tetanus-toxoid-containing vaccine. Coverage of the third dose of diphtheria–tetanus–polio vaccine ranged from 65% to 98% across the 14 countries in 2013. In hospital-based studies, non-neonatal tetanus comprised 0.3–10.7% of admissions, and a median of 71% of patients were men. The identification of tetanus cases following voluntary medical male circumcision highlights a gender gap in tetanus morbidity disproportionately affecting men. Incorporating tetanus vaccination for boys and men into national programmes should be a priority to align with the goal of universal health coverage.

Introduction
Tetanus is a rapidly progressing, painful disease with a high mortality rate, yet is inexpensive to prevent. Although tetanus toxoid was first licensed as a vaccine in 1937, tetanus remains a public health problem in many parts of the world and is often fatal, even within modern intensive care facilities.1,2 According to World Health Organization (WHO) recommendations, a series of three tetanus-toxoid-containing vaccine doses should be given in infancy, followed by booster doses at the age of school entry, in adolescence and in adulthood to induce longer-term immunity.1,3 WHO’s focus on the elimination of maternal and neonatal tetanus by 2015 led to vaccination strategies targeting women of reproductive age and infants.1,3 Less attention, however, has been given to the immunization of males after infancy. Data on child and adult vaccination coverage and tetanus incidence and mortality among men are limited.

Emerging reports of cases of tetanus following voluntary medical male circumcision in different sub-Saharan African countries drew our attention to the possibility of a gender disparity in tetanus morbidity that disproportionately affected men. In this paper we report a summary of the reported tetanus cases, together with a review of the evidence on tetanus vaccination coverage and case notification in sub-Saharan Africa, supplemented by a review of the literature on non-neonatal tetanus over the past 10 years.

Emerging reports

Context
Voluntary medical male circumcision is an effective intervention to reduce the risk of human immunodeficiency virus (HIV) acquisition among men. When the intervention is scaled-up, HIV incidence is reduced and costs are saved for health programmes and budgets.4 In 2007, WHO and the Joint United Nations Programme on HIV/AIDS recommended the intervention in countries with a high prevalence of HIV and historically low rates of male circumcision.5 By the end of 2015 over 11 million men had been circumcised through voluntary medical male circumcision programmes in 14 priority countries in eastern and southern Africa: Botswana, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, Swaziland, the United Republic of Tanzania, Uganda, Zambia and Zimbabwe (unpublished data, WHO, 2016). As an elective procedure chosen by often healthy men to reduce future HIV risk, ensuring its safety is a priority. Three conventional surgical methods (dorsal slit, forceps-guided and sleeve resection) and two device methods (clamps or collars that remain in place for 1 week) have been used. WHO has recommended 10 standards for quality assurance, including infection prevention and control,6 and has encouraged each country to carry out adverse event surveillance, particularly when implementing new methods. WHO made an initial review of adverse events identified from voluntary medical male circumcision programmes in 2014 and continues to do so through post-market surveillance and country reports.

Tetanus case reports
We examined summary reports of all tetanus cases reported to the national voluntary medical male circumcision programmes and submitted to WHO. Additional details were requested from ministries of health as needed. We identified reports of 13 cases of tetanus in which the client presented for care within 14 days of a voluntary medical male circumcision procedure; eight cases resulted in death (Table 1). The cases, recorded from April 2012 up to March 2016, were reported from five of the 14 priority African countries: Kenya, Rwanda, Uganda, the United Republic of Tanzania and Zambia.

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a Department of HIV/AIDS, World Health Organization, 20 Avenue Appia, 1211 Geneva, Switzerland.
b Office of the Global AIDS Coordinator, United States Department of State, Washington DC, United States of America.
c Department of Immunization, Vaccines and Biologicals, World Health Organization, Geneva, Switzerland.
d Department of HIV, TB and Hepatitis, Communicable Diseases Cluster, World Health Organization Regional Office, Harare, Zimbabwe.
Correspondence to Julia Samuelson (email: samuelsonj@who.int).
Submitted: 11 November 2015 – Revised version received: 7 March 2016 – Accepted: 8 March 2016 – Published online: 2 June 2016.
The circumcision methods included both conventional surgery (eight patients, of whom five died) and an elastic collar compression device method (five patients, of whom three died). The period from surgery or device placement to symptom onset ranged from 5 to 12 days, with a mean of 11.8 days to clinical diagnosis. Mean time to death was 15.8 days for the eight patients who died. Using a standardized case definition,9 12 of the 13 cases were consistent with a causal association with male circumcision. Health-care providers who examined the patients for tetanus reported that the circumcision wound was septic in seven patients, whereas the same circumcision wound was noted to be clean in six patients at a circumcision follow-up visit before tetanus was diagnosed. It is possible that health-care providers unfamiliar with the appearance of circumcision wound healing may have misclassified the wound as septic. Alternatively, the infection could have occurred after the last circumcision visit or could have been from another injury. Five patients had other potential wound sites including injuries and infections of the lower limbs. A home remedy had been applied to the circumcision wound in five patients treated with surgery and possibly in two patients with devices. Hygiene conditions of the person or his home were noted to be poor in five patients.

Nine of the 13 patients were adolescents (aged 10–19 years). All men who were working had outdoor-based occupations such as farming and brick-making. Based on records or patients’ recall, only one of the 13 patients had a history of tetanus vaccination. However, three patients had received tetanus toxoid immediately before the procedure; one patient because pre-surgical vaccination was the routine practice of the clinic that provided the circumcisions and two patients because the programme instructions were updated in 2015. One of these patients died after device-type circumcision.

Non-neonatal tetanus risk

Tetanus notifications

These emerging reports of tetanus cases after voluntary male circumcision prompted us to review the global data on non-neonatal tetanus. We examined the official WHO database for country-specific annual numbers of reported tetanus cases.10 Although non-neonatal tetanus (i.e. cases in patients over the age of 28 days) is not a reportable condition, some countries report both neonatal and non-neonatal cases. Neonatal tetanus reporting to the WHO notifiable surveillance system has very low notification efficiency, ranging from 3% to 11%,11 and cases of non-neonatal tetanus have not been routinely reported by most countries. Due to this differential reporting, comparisons across individual countries and WHO regions were difficult. As an indication, however, in 2013 the WHO African Region had the highest reported number of non-neonatal tetanus cases at 4.0 per million population (3732 cases among the total regional population of 927 370 712; Table 2), followed by the South-East Asia Region at 1.9 per million population (3432 cases among 1 855 067 643 people). Of the 12 African countries reporting any cases of non-neonatal tetanus, Uganda – the only country among them implementing voluntary medical male circumcision for HIV prevention – had the highest number of non-neonatal tetanus cases at 67.1 per million population (2522 cases among 37 578 880 people; Table 3).

Tetanus vaccination coverage

We also analysed the global joint WHO and United Nations Children’s Fund database12 for official data on countries’ coverage of the third dose of infant diphtheria–pertussis–tetanus (DPT3) vaccine from 1980 to 2013, grouped by WHO region. Coverage of fourth, fifth and sixth booster doses are not routinely reported. In 1980, when WHO started collecting data on DTP3 vaccination coverage, all regions apart from the Americas and European had coverage under 20%. Since then, global coverage of DTP3 vaccination increased steeply (Fig. 1) and by 2013 the lowest regional coverage was 75% in the WHO African Region and the global average was 86%.

Fig. 2 shows DTP3 vaccination coverage in the nine African countries implementing voluntary medical male circumcision that have reported a case of tetanus after the procedure or that have
low DTP3 coverage (≤75% coverage in at least 2 years since the year 2000). Among these countries, the DTP3 vaccination coverage reached 80% on average in 2005 and ranged from 65% in South Africa to 98% in Rwanda in 2013. As far as we are aware, most of the 14 priority countries for voluntary medical male circumcision have no policy for vaccinating males against tetanus after infancy.

**Literature review**

To supplement evidence from the surveillance data, we conducted a literature review to gather additional information on non-neonatal tetanus. We searched the PubMed database using the MeSH terms “tetanus” and “Africa South of the Sahara”. We restricted the results to human studies in the period 2003–2014 and included all studies on adolescents and adults in any language. We excluded studies related to neonatal tetanus as well as case reports. At a minimum we reviewed all abstracts, including English versions of non-English publications, and obtained the full text of selected manuscripts.

Our database search resulted in 259 studies, of which 28 were on non-neonatal tetanus; we included a further four studies identified from references or by colleagues. These 32 studies originated from 10 African countries; all were based on hospital inpatient cases. Their key features are summarized in Table 4. Across the studies, a median of 71% of patients admitted to hospital with tetanus were men. The median age of tetanus patients (estimated from the mean and median ages, as reported in the articles) was 32.7 years. Non-neonatal tetanus cases comprised 0.3–10.7% of all hospital admissions, and in one Côte d’Ivoire study, surgery-related tetanus constituted 11.0% of all 273 non-neonatal tetanus admissions. The median case fatality rate from non-neonatal tetanus was 44.0% and ranged from 0% of 12 inpatients in a small Nigerian study to 80.0% of 175 children in another Nigerian study. Ten studies listed lower limb injuries as one of the main causes of tetanus, and two studies mentioned male circumcision among their infection sources. Based on the eight studies reporting vaccination status, high proportions of tetanus inpatients had not been vaccinated (range: 83–100%) or had unknown vaccination status.

**Discussion**

Our investigation into tetanus cases identified through voluntary medical male circumcision programmes and an analysis of available global data highlights a gender gap in tetanus morbidity that disproportionately affects men. The occurrence of tetanus following voluntary medical male circumcision was rare – with 13 cases reported from programmes that have conducted over 11 million procedures by the end of 2015 – and may be no higher than the background incidence of tetanus among men in these countries.

National tetanus case reporting and hospital studies suggest that the incidence...
Tetanus deaths in men

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Policy & practice

Tetanus burden may be higher than we found. The efforts worldwide towards the goal of elimination of maternal and neonatal tetanus has reduced tetanus incidence and mortality in those groups through vaccination during pregnancy and clean delivery and cord-care practices. However, adolescent and adult men seem to have been largely missed by vaccination programmes, as implementation of the WHO-recommended fourth to sixth doses of tetanus vaccine to adolescents and adults has been limited. Only one of the 13 tetanus cases reported by voluntary medical male circumcision programmes had a known history of tetanus vaccination. Three clients received a dose of tetanus-toxoid-containing vaccine immediately before male circumcision; two recovered from the tetanus infection and one died.

We found that infant tetanus-toxoid-containing vaccine coverage levels in the African Region as a whole, and in some countries in particular, were historically low, although they have increased greatly since 1980. Countries with a history of low coverage of infant immunization, and no national policy or practice for tetanus vaccine administration to adolescent or adult men, could be expected to have a large proportion of adolescent and adult men who are insufficiently protected against tetanus infection. These men are therefore at risk of acquiring tetanus from injuries or surgical procedures. Voluntary medical male circumcision programmes must maintain quality assurance standards, including infection control, and inform clients of the risk of tetanus if the circumcision wound is exposed to substances that might be contaminated with Clostridium tetani spores, including home remedies.

Incorporating tetanus vaccination into voluntary medical male circumcision programmes should be seen as a priority. In vaccine-naïve individuals, two tetanus-toxoid-containing vaccine doses spaced 4 weeks apart are needed, with a further 2-week interval before performing the procedure. Providing a booster dose at least seven and ideally 14 days before voluntary medical male circumcision in individuals who are not fully vaccinated may induce partial immunity; an additional dose given after the procedure would also provide longer-term immunity. In the long term, tetanus vaccination, which costs less than 1 United States dollar, should be included in school-based programmes for both girls and boys at ages 4–7 years and 12–15 years, with additional targeting of...
Table 4. Summary of hospital studies of non-neonatal tetanus in sub-Saharan Africa countries, 2003 to 2014

<table>
<thead>
<tr>
<th>Reference</th>
<th>Country</th>
<th>Study period</th>
<th>Population</th>
<th>Total no. of hospital admissions</th>
<th>Non-neonatal tetanus cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawe et al. (2014)</td>
<td>United Republic of Tanzania</td>
<td>2009–2011 ICU admissions at four tertiary hospitals</td>
<td>5627</td>
<td>135 – 71.0</td>
<td></td>
</tr>
<tr>
<td>Muteya et al. (2013)</td>
<td>Democratic Republic of the Congo</td>
<td>2005–2009 All tetanus admissions</td>
<td>1029</td>
<td>22 39.4% 95.2 52.4</td>
<td></td>
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<tr>
<td>Traoré et al. (2013)</td>
<td>Guinea</td>
<td>2001–2012 Tetanus cases at all hospitals in Conakry</td>
<td>8649</td>
<td>239 – 73.0 75</td>
<td></td>
</tr>
<tr>
<td>Oshinaik et al. (2012)</td>
<td>Nigeria</td>
<td>2006–2011 Tetanus admissions, age &gt; 10 years</td>
<td>9374</td>
<td>218 29.4% 75.6 56.2</td>
<td></td>
</tr>
<tr>
<td>Bankole et al. (2012)</td>
<td>Nigeria</td>
<td>2000–2009 Adult tetanus admissions</td>
<td>78009</td>
<td>190 30.4% 75.0 16.3</td>
<td></td>
</tr>
<tr>
<td>Amare et al. (2012)</td>
<td>Ethiopia</td>
<td>2001–2009 Tetanus admissions, age ≥ 13 years</td>
<td>– 68 33.8% 77.9 35.3</td>
<td></td>
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<tr>
<td>Minta et al. (2012)</td>
<td>Mali</td>
<td>2004–2009 Tetanus admissions, age ≥ 15 years</td>
<td>1839</td>
<td>119 32.9% 84 46.2</td>
<td></td>
</tr>
<tr>
<td>Aba et al. (2012)</td>
<td>Côte d'Ivoire</td>
<td>2003–2008 Surgical tetanus cases</td>
<td>273</td>
<td>29 36.0% 79 45.0</td>
<td></td>
</tr>
<tr>
<td>Amare et al. (2011)</td>
<td>Ethiopia</td>
<td>1996–2009 Tetanus admissions, age ≥ 13 years</td>
<td>– 171 33.0% 75.4 38.0</td>
<td></td>
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<tr>
<td>Ugwu and Ugwu (2011)</td>
<td>Nigeria</td>
<td>1999–2008 Children after intramuscular injection</td>
<td>175</td>
<td>– 12 – 60.0 80.0</td>
<td></td>
</tr>
<tr>
<td>Akhswa et al. (2010)</td>
<td>Nigeria</td>
<td>2005–2008 Post-neonatal tetanus cases</td>
<td>– 18 5.8% 77.0 5.9</td>
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<tr>
<td>Fawibe (2010)</td>
<td>Nigeria</td>
<td>2002–2006 Adult tetanus admissions</td>
<td>3514</td>
<td>41 33.0% 85.7 57.1</td>
<td></td>
</tr>
<tr>
<td>Tadesse et al. (2009)</td>
<td>Ethiopia</td>
<td>2003–2008 Adult tetanus admissions</td>
<td>– 29 35.0% 65.5 41.4</td>
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<tr>
<td>Dao et al. (2009)</td>
<td>Mali</td>
<td>2001–2004 All tetanus admissions</td>
<td>965</td>
<td>57 39.0% 69.0 38.9</td>
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<tr>
<td>Zziwa et al. (2009)</td>
<td>Uganda</td>
<td>2005–2008 All tetanus admissions</td>
<td>25118</td>
<td>145 – 66.0 38.4</td>
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<tr>
<td>Chukwuabike et al. (2009)</td>
<td>Nigeria</td>
<td>1996–2005 Tetanus admissions, age ≥ 16 years</td>
<td>8762</td>
<td>86 30.2% 58.1 42.9</td>
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<tr>
<td>Ajose and Odusanya (2009)</td>
<td>Nigeria</td>
<td>2004–2006 Adult tetanus admissions</td>
<td>– 164 29.6% 75.6 70.1</td>
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<tr>
<td>Soumaré et al. (2008)</td>
<td>Senegal</td>
<td>1999–2006 Post-circumcision tetanus at infectious diseases clinic</td>
<td>27295</td>
<td>1201 9.0% n/a 7.4</td>
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<tr>
<td>Onwukekwe et al. (2008)</td>
<td>Nigeria</td>
<td>1999–2003 All tetanus admissions</td>
<td>– 12 29.8% 58.0 0.0</td>
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<tr>
<td>Komolafe et al. (2007)</td>
<td>Nigeria</td>
<td>1995–2004 Adult tetanus admissions</td>
<td>– 79 – 70.9 45.0</td>
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<tr>
<td>Sanya et al. (2007)</td>
<td>Nigeria</td>
<td>1990–2001 Adult tetanus admissions</td>
<td>– 288 36.1% 69.3 63.9</td>
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<tr>
<td>Melaku et al. (2005)</td>
<td>Ethiopia</td>
<td>1985–2000 All tetanus admissions</td>
<td>3548</td>
<td>146 32.3% 69.9 49.3</td>
<td></td>
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<tr>
<td>N'dour et al. (2005)</td>
<td>Senegal</td>
<td>1999–2002 Tetanus after intramuscular injection</td>
<td>– 46 34.5% 63 60.8</td>
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<tr>
<td>Soumaré et al. (2005)</td>
<td>Senegal</td>
<td>Mar–Sep 2002 Children with tetanus, age 1–15 years</td>
<td>757</td>
<td>40 8.8% 75.0 8.0</td>
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<tr>
<td>Soumaré et al. (2005)</td>
<td>Senegal</td>
<td>Sep–Dec 2002 Tetanus admissions, age ≥ 4 years</td>
<td>– 30 36.0% 70.0 26.7</td>
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<tr>
<td>Ojini and Danesi (2005)</td>
<td>Nigeria</td>
<td>1990–1999 Tetanus admissions, age ≥ 10 years</td>
<td>– 349 29.8% 66.0 37.0</td>
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<tr>
<td>Seydi et al. (2005)</td>
<td>Senegal</td>
<td>2001–2003 Tetanus admissions, age ≥ 28 days</td>
<td>4123</td>
<td>440 20.0% 70.7 22.0</td>
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</table>

(continues . . .)
In conclusion, although both men and women are at risk of tetanus infection, our analyses show that there is an underlying burden of tetanus among adolescent and adult men who have been largely missed by vaccination programmes. Incorporating tetanus-toxoid-containing vaccine for boys and men into national immunization programmes should be encouraged to reduce the morbidity and mortality from this preventable disease. Enhanced personal hygiene and wound-care practices should also be emphasized after voluntary medical male circumcision. Elevating non-neonatal tetanus to a reportable condition would fill the knowledge gap about the incidence. The convergence of cost–effective solutions to two public health problems affecting men—HIV and tetanus—offers opportunities for service synergies and enhanced health equity. Addressing this gender gap, and aligning with goals for universal health coverage and access to vaccines for all, should be an explicit policy goal for national health programmes and relevant partners.

Acknowledgements
Dedicated to the memory of Dr Martha H Roper whose public health career contributed to preventing illness and deaths from tetanus.

Funding: This work was supported by the United States Centers for Disease Control and Prevention.

Competing interests: None declared.

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<tr>
<td></td>
<td>Côte d’Ivoire</td>
<td>1985–1998</td>
<td>All tetanus admissions</td>
<td>62,313</td>
<td>1,870</td>
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</tbody>
</table>

ICU: intensive care unit.

Note: Dashes indicate data not available or not applicable.

Malnutrition

Cases of tetanus deaths in men

2003–2014

Over the years, tetanus deaths in men have decreased due to increased vaccination coverage and better healthcare. However, there is still a need to ensure long-lasting protection against this disease.

Some of the limitations of our analyses are that first, many countries do not report non-neonatal tetanus cases to WHO. This reporting difference may lead to the underestimation of cases appearing greater in some countries or regions than in others. For this reason, we have limited our interpretation of these data to an indication of broad trends in tetanus rates and not an analysis of incidence. Second, our review of the literature was limited to one database. However, we believe it was sufficient to gain a general picture of the burden of non-neonatal tetanus in sub-Saharan Africa.

In conclusion, although both men and women are at risk of tetanus infection, our analyses show that there is an underlying burden of tetanus among adolescent and adult men who have been largely missed by vaccination programmes. Incorporating tetanus-toxoid-containing vaccine for boys and men into national immunization programmes should be encouraged to reduce the morbidity and mortality from this preventable disease. Enhanced personal hygiene and wound-care practices should also be emphasized after voluntary medical male circumcision. Elevating non-neonatal tetanus to a reportable condition would fill the knowledge gap about the incidence. The convergence of cost–effective solutions to two public health problems affecting men—HIV and tetanus—offers an opportunity for service synergies and enhanced health equity. Addressing this gender gap, and aligning with goals for universal health coverage and access to vaccines for all, should be an explicit policy goal for national health programmes and relevant partners.

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Tetanus deaths in men

Résumé

Les cas de tétanos et de décès liés au tétanos dans la population masculine révèlent la nécessité de la vaccination

Avec l'orientation des efforts sur l'élimination du tétanos maternel et néonatal, une moindre attention a été portée sur l'incidence et la mortalité du tétanos dans la population masculine. Depuis 2007, la circoncision médicale masculine volontaire s'est intensifiée dans 14 pays d'Afrique subsaharienne, en tant qu'intervention efficace pour réduire le risque d'acquisition du virus de l'immunodéficience humaine (VIH) chez les hommes. Dans le cadre d'une analyse des effets indésirables de ces programmes, nous avons identifié 13 cas de tétanos, dans cinq pays, qui ont été notifiés à l'Organisation mondiale de la Santé (OMS) jusqu'à mars 2016. Huit patients sont décédés et un seul patient avait un antécédent connu de vaccination antitétanique. Sur plus de 11 millions de procédures réalisées, les infections tétaniques suite à une circoncision médicale masculine volontaire ont été rares. Néanmoins, ces cas d'infection nous ont poussés à mener une étude des données disponibles sur la couverture antitétanique et sur la notification des cas en Afrique subsaharienne, complétée par une revue de la littérature sur le tétanos non-néonatal en Afrique sur la période de 2003 à 2014. Sur la période étudiée, les pays répertoriés dans la Région africaine de l'OMS correspondent au plus grand nombre de cas de tétanos non-néonatal pour un million d'habitants et à la plus faible couverture vaccinale par anatoxine tétanique. En 2013, dans les 14 pays considérés, le taux d'administration de la troisième dose du vaccin diphtérie-tétanos-poliovirus se situait entre 65% et 98%. Selon les études réalisées dans des hôpitaux, le tétanos non néonatal est responsable de 0,3 à 10,7% des admissions, pour lesquelles 71% des patients, en moyenne, sont des hommes. L'identification des cas de tétanos déclarés après une circoncision médicale masculine volontaire a permis de révéler une disparité homme-femme en termes de mortalité, en défaveur des hommes. L'intégration de la vaccination antitétanique des garçons et des hommes dans les programmes nationaux devrait être une priorité pour poursuivre l'objectif de couverture sanitaire universelle.

Summary

Cases of tetanus and deaths of men from tetanus reveal the need for vaccination

With the orientation of efforts on the elimination of maternal and neonatal tetanus, less attention has been paid to the incidence and mortality of tetanus in the male population. Since 2007, male circumcision as a voluntary medical procedure in 14 African countries, as an effective intervention to reduce the risk of acquiring human immunodeficiency virus (HIV) among men, has intensified. In the framework of an analysis of adverse effects of these programs, we have identified 13 tetanus cases, in five countries, which were reported to the World Health Organization (WHO) until March 2016. Eight patients died and one patient had a known history of tetanus vaccination. More than 11 million procedures performed, the tetanus infections following voluntary male circumcision were rare. Nonetheless, these infection cases have prompted us to conduct a study of the available data on the antitetanus coverage and on the notification of cases in Sub-Saharan Africa, complemented by a review of the literature on non-neonatal tetanus in Africa on the period from 2003 to 2014. During the period studied, the countries listed in the African region of the WHO corresponded to the largest number of non-neonatal tetanus cases for one million inhabitants and to the lowest vaccination coverage with tetanus toxoid. In 2013, in the 14 countries considered, the third dose of the diphtheria-tetanus-polio vaccine was between 65% and 98%. According to hospital studies, tetanus non-neonatal was responsible for 0.3 to 10.7% of admissions, for which 71% of patients, on average, were men. The identification of tetanus cases declared after voluntary male circumcision has revealed a gender disparity in terms of mortality, in favor of men. The integration of male vaccination against tetanus into national programs should be a priority to continue achieving universal health coverage.
La enfermedad del tétanos y las muertes en hombres revelan la necesidad de vacunación

Dado que se han concentrado los esfuerzos en la eliminación del tétanos materno y neonatal, se ha prestado menos atención a la incidencia y mortalidad del tétanos en los hombres. Desde 2007, ha aumentado la circunfreción médica masculina voluntaria en 14 países subsaharianos, junto con una revisión documental del realizadas. No obstante, los casos dieron lugar a una revisión de la prueba tétanos era poco frecuente entre más de 11 millones de intervenciones el tétanos. Tras practicar la circuncisión médica voluntaria, el casos notificados a la Organización Mundial de la Salud (OMS) hasta marzo de 2016. Ocho pacientes murieron y solo uno estaba vacunado contra el tétanos. Tras practicar la circuncisión médica masculina voluntaria, el tétanos era poco frecuente entre más de 11 millones de intervenciones realizadas. No obstante, los casos dieron lugar a una revisión de la prueba de la cobertura de vacunas contra el tétanos y las notificaciones de los casos en el África subsahariana, junto con una revisión documental del tétanos no neonatal en África durante los años 2003 a 2014. La OMS de la región africana informó del mayor número de casos de tétanos no neonatal por cada millón de habitantes y de la menor cobertura de la vacuna con toxoide tétánico de la historia. En 2013, la cobertura de la tercera dosis de la vacuna de la difteria, tétanos, polio abarcó de un 0,3% y un 10,7% de admisiones, y una media de 71% de los pacientes eran hombres. La identificación de los casos de tétanos tras la circunfreción médica masculina voluntaria destaca una diferencia desproporcionada entre hombres y mujeres en cuanto a la morbilidad por tétanos, en detrimento de los hombres. La incorporación de vacunas contra el tétanos para niños y hombres en programas nacionales debería ser prioritaria para ajustarse al objetivo de cobertura sanitaria universal.

Resumen

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