DISEASE WATCH | IN THE NEWS

West Nile virus strikes again

In the past 5 years at least 550 people have died in the United States from West Nile virus (WNV), which is now endemic. On May 28, the first confirmed case this year was admitted to hospital in New Mexico — the patient has now recovered. Because the mosquito season does not usually start until August, this case is far

earlier than was expected. Mosquitoes acquire the virus when they bite infected birds and then transmit it to humans. Amy Bode (CDC) warned against predicting an epidemic but urged US state health authorities to take precautions and in the United Kingdom scientists at Porton Down are monitoring birds (antibodies to WNV indicate that some birds have already been exposed to the virus), mosquitoes and humans for live virus, in case environmental factors lead to WNV emerging in the United Kingdom. **CNN**

Ebola in Sudan

Teams from the WHO south Sudan early warning and response network (EWARN) and the WHO headquarters are continuing to work together to control an outbreak of the Ebola virus — which causes a deadly haemorrhagic fever that kills up to 90% of its victims — which has claimed 20 victims, including 5 fatalities, in

south Sudan. Last year an Ebola outbreak killed more than 150 people in the Republic of the Congo. **WHO**

Polio vaccination back on track

The Nigerian Kano state governor, Ibrahim Shekarau, is now ready to resume polio vaccination after an 8-month ban — but the date that vaccination will recommence has not yet been announced. New cases of polio have quadrupled to 133 in the past year and the virus has spread from northern Nigeria to surrounding African countries. Claims by Nigerian clerics and politicians that the vaccine contained a hormone that caused infertility were dismissed by the WHO. Shekarau announced that a team of health and religious workers sent to inspect an Indonesian polio vaccine-manufacturing company were convinced that vaccine from that source was safe. Once a

CDC/Jim Gathany

DISEASE WATCH | FOCUS

Chlamydia

BACKGROUND

Causative agents. Three *Chlamydia* species are currently recognized as human pathogens: *Chlamydia trachomatis*, *Chlamydia pneumoniae* and *Chlamydia psittaci*. *C. trachomatis* infections are the most common bacterial cause of sexually transmitted disease (STD) in humans¹. Most infected patients are asymptomatic and do not seek medical treatment. Untreated infection in both sexes increases the risk of HIV infection². In the absence of treatment, the infection can cause pelvic inflammatory disease in up to one-third of infected women, which can lead to infertility and potentially fatal ectopic pregnancies. Chlamydial infection is also common among young men, who rarely seek screening. Once diagnosed, the infection can be treated with doxycycline, azithromycin, ofloxacin or erythromycin. The species *C. trachomatis* also includes the trachoma serovars A, B, Ba and C. Trachoma is the leading cause of preventable infectious blindness, accounting for at least 15% of blindness worldwide³. The chlamydiae are transmitted from eye to eye, and eye-seeking (synanthropic) flies are an important factor in spreading disease⁴. Active trachoma ranges from a mild asymptomatic inflammation to an intense inflammatory response. Neonatal conjunctivitis can also be caused by the genital serovars of *C. trachomatis* and is acquired during birth⁵. Untreated, between 10 and 20% of infected children develop neonatal pneumonia. *C. trachomatis* is a significant cause of childhood pneumonia (20–30%) in hospitalized patients less than 6 months old. *C. pneumoniae* is transmitted by aerosols and is a common cause of human respiratory disease, causing approximately 10% of community-acquired pneumonia and 5% of pharyngitis, bronchitis and sinusitis⁶. Recent seroepidemiological evidence has associated *C. pneumoniae* infection with an enhanced risk of developing atherosclerotic and cerebrovascular disease⁷.

Distribution. Chlamydial STD and *C. pneumoniae* infections are found worldwide. Blinding trachoma is found predominantly in the poorest countries of Africa, Asia, the western Pacific and parts of Oceania (FIG. 1).

Current global status. An estimated 89 million new cases of sexually transmitted chlamydial infections occur worldwide each year¹ (FIG. 1), and this is probably an underestimate of the actual number of cases⁵. In the United States, young adults aged 18 to 26 years have a prevalence of 4.19%, with women more likely to be infected than men⁸. Six million people are irreversibly blinded by trachoma³, and 146 million cases of active disease require treatment. More than 500 million people live in trachoma-endemic areas⁹. *C. pneumoniae* is a common cause of community-acquired pneumonia worldwide⁶. Half of the global adult population (>20 years of age) shows serological evidence of past infection with *C. pneumoniae*, with infection being more common in the elderly.

RECENT DEVELOPMENTS

New basic knowledge. There is no useful gene-transfer system for chlamydiae. However, their small genome (~1 Mb) has allowed complete genome sequencing of several human isolates. Comparative genomics

Figure 1 | The distribution of blinding trachoma. The numbers indicate WHO estimates of the prevalence of sexually transmitted *Chlamydia* infections among adults in 1999.

formal decision to vaccinate against polio is made, the WHO, Rotary International and UNICEF will arrange a large-scale programme to vaccinate all Nigerian children under 5 years of age. **New York Times**

Clean solution for diarrhoeal deaths?

A study led by Stephen Luby (CDC) monitored a group of 900 families in squatter slums in Karachi, Pakistan, that were supplied with soap by a weekly health visitor, together with instructions and encouragement on how to wash hands. Handwashing, in spite of the faecal-contaminated water, halved the diarrhoea burden in families that used soap compared with control families. Infants, who cannot wash their own hands, are most at risk of dying from diarrhoea — but if others regularly wash their hands then the

transmission of potential pathogens to food, or to the infant through touch, is reduced. Diarrhoea kills 5,000 children each day worldwide according to the WHO — and researchers now hope to find a cost-effective method of promoting handwashing to greatly reduce this figure. **JAMA**

CDC/Kimberly Smith, Christine Ford

Probiotics for breastfeeding mothers

Routine treatment of pregnant women with antiretroviral drugs has reduced mother-to-child HIV transmission, but the same drugs cannot be used to treat infants. Breastfeeding is thought to be the best way to feed a baby, but it is an important route of HIV transmission to infants. Many HIV-positive mothers still breastfeed either because it is culturally unacceptable to bottle-feed, or because the water quality is too poor. New research shows that some lactobacilli strains can bind to HIV and that one strain prevented HIV from infecting cells. Work is underway to develop lactobacilli-based probiotic drinks for infants to combat HIV present in their mothers milk.

Reuters

In the News was compiled with the assistance of David Ojcius, University of California, Merced, USA.

has begun to yield new insights into the pathogenic potential of these organisms¹⁰. The presence or absence of a functional tryptophan synthase is a reliable marker for distinguishing ocular and genital biovars of *C. trachomatis*¹¹, and might reflect the importance of the polymicrobial environment in the female lower genital tract for successful chlamydial transmission. Genomic data also indicate that chlamydiae possess a type III secretion system that coordinately translocates chlamydial effector proteins into the cytoplasm of the host cell^{10,12}. This results in several important alterations, including initiation of signal-transduction pathways, modulation of apoptotic responses and alteration of membrane trafficking. Genome sequencing has also provided the means for identifying the complete chlamydial transcriptome and proteome patterns under several different growth conditions.

New tools and interventions. The most effective strategy for preventing chlamydial STDs is education about the consequences of unprotected sexual intercourse. As treatment with a single dose of oral antibiotics is effective, early detection is an important strategy to contain transmission. But as the infection is frequently asymptomatic, infected people are often not diagnosed. Alternatively, active screening for chlamydial STDs in high-risk populations could decrease the incidence of infection. The prevalence of infection was found to be 9.2% in US female military recruits, but it was estimated that 98.2% of these infections could have been prevented had a screening programme been in place¹³.

New strategies, policies and partnerships. Spread of the trachoma biovars is facilitated by poverty and lack of access to healthcare and clean water. The WHO is leading an international alliance — the Alliance for the Global Elimination of Blinding Trachoma by 2020 (GET 2020) — to work towards the worldwide elimination of trachoma¹⁴. These efforts will seek community involvement and will focus on a combination of interventions known as SAFE — surgery for trichiasis, antibiotics, facial cleanliness and environmental improvement. An important component of the strategy is the use of a single oral-dose antibiotic (azithromycin), an improvement on the previous regime of daily applications of tetracycline eye ointments over

a six-week period. Pfizer has provided azithromycin free of charge for use in pilot trachoma-prevention studies. The development of a protective vaccine has involved the cooperation of government agencies (NIH, MRC), private foundations (Edna McConnell Clark Foundation) and corporate interests (GlaxoSmithKline).

CONCLUSION AND FUTURE OUTLOOK

Eliminating trachoma will be possible if new intervention strategies are combined with improved hygiene standards and economic advancements in the developing world, where trachoma remains endemic. The problems associated with chlamydial STDs are more difficult to deal with due to the combination of a high rate of asymptomatic, acute infections and chronic upper genital tract sequelae in women. Better diagnostics and earlier intervention are crucial. Infections due to *C. pneumoniae* remain problematic as they can be related to chronic conditions such as asthma, cardiovascular disease and neurological disorders.

Information sources: Robert Belland, David M. Ojcius & Gerald I. Byrne. e-mail: rbelland@utmem.edu; dojcius@ucmerced.edu; gbyrne@utmem.edu University of Tennessee, Memphis, TN 38163, USA. University of California, Merced, CA 95344, USA. doi:10.1038/nrmicro931

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Online links

FURTHER INFORMATION

Chlamydia: <http://www.Chlamydiae.com/>
Prevention of blindness and deafness: <http://www.who.int/pbd/en/>
WHO GET 2020: <http://www.who.int/pbd/blindness/trachoma/en/>
International Trachoma Initiative: <http://www.trachoma.org/home.asp>
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