

## *The dangers of vaccine refusal: the case of measles outbreaks*



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Recently the international mass media has been full of reports about measles outbreaks in the United States of America (USA). Yet the World Health Organization declared the USA as having eliminated measles in the year 2000.<sup>1</sup> This means that because of high herd immunity, measles was no longer circulating in the USA population, with sporadic cases being imported from other countries, followed by very limited, if any, endemic spread. At that time there were <100 cases of measles per year (total population in 2000: ~282 million), and 2002-2007 saw a downward trend in cases. However, 2008 saw several outbreaks in unvaccinated communities (i.e. those with high rates of vaccine refusal, such as the Amish), resulting in >100 cases, with only 13% being imported, the rest being transmitted from imported cases. This pattern was repeated in 2011 (>200 cases), 2013 (almost 200 cases), 2014 (>600 cases) and 2015 (173 cases by 29 May 2015).<sup>2</sup>

When we compare these USA outbreaks to the situation in South Africa, it is tempting to dismiss them as tiny blips of little consequence. After all, sub-optimal measles vaccination coverage in South Africa led to 1676 confirmed measles cases in July 2003-November 2005, and 18 434 confirmed measles cases in January 2009-May 2011.<sup>3</sup> Also, before these outbreaks occurred, an average of 33 cases per annum were reported in 1998-2003 (total population in 2003: ~46 million). Thus the annual measles incidence (i.e. the number of cases per year divided by the total population size that year) in South Africa was much greater than that of the USA. And while the USA outbreaks are linked to high levels of vaccine refusal within relatively small unvaccinated communities,<sup>1,2</sup> in South Africa we have only anecdotal reports that vaccine refusal plays a role in our outbreaks.<sup>4,5,6</sup> Previous South African vaccination coverage surveys, conducted mainly in poor communities using the public health sector, have in fact found that the reasons behind children missing some vaccines include missed vaccination opportunities (i.e. when a child with no contra-indications for vaccination, who is missing one or more vaccinations is brought to the clinic but is not vaccinated), incorrect information given by clinic staff, vaccine stock-outs and lack of access to clinics.<sup>5</sup>

So should South African healthcare workers be worried about what is happening in the USA? The short answer is "Yes", based on three reasons. First, South Africa is part of a global community that communicates via

the Internet. The South African Vaccination and Immunisation Centre at the Sefako Makgatho University recently conducted a study on anti-vaccination lobbying on the South African Internet (accepted for publication by the South African Medical Journal).<sup>7</sup> This study was prompted by numerous calls from parents who were worried about vaccinating their children because of anti-vaccination claims found on the Internet. Publication ethics prevent the results from being published in WhyKids,



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but in essence this study found that South Africans are being influenced by vaccination misinformation emanating mainly from the USA. While this study did not include South African social media sites, there is evidence on Facebook that many South African parents are paying attention to this misinformation, and are not vaccinating their children - see <https://www.facebook.com/VASAvax?fref=ts> for some of the Facebook posts, and <https://www.facebook.com/groups/vaccineawarenessvasa> for a glimpse of the 5431 South African parents who are members (9 June 2015) of the "Vaccine

Awareness South Africa - VASA" Facebook group. Clearly the socio-demographics of VASA are very different from the population groups previously surveyed in South African vaccination coverage studies, and research is currently underway to establish if their views are commonly held by others within this socio-demographic stratum.

Second, unlike the USA where only 14% of measles cases were hospitalised and no deaths were reported in the latest outbreaks,<sup>1\*</sup> measles outbreaks in South Africa often result in severe complications and death. For example, from 1 November 2009 to 31 July 2010, one public hospital in the Western Cape diagnosed 1861 cases of measles, 30% (552) of whom were hospitalised because of severe complications. Of those hospitalised, 3% (18) died, while four children required tracheostomies and multiple re-admissions, with one child remaining tracheostomised at the end of the study in March 2012. Tragically, 65% (357) of those hospitalised were <9months of age, thus being too young to be vaccinated, 12 of whom died.<sup>8</sup>

Third, measles is the most infectious of all vaccine-preventable diseases, and 95% of the population must be vaccinated to achieve herd immunity.<sup>3,8</sup> The fact that South Africa experiences measles outbreaks, points to pockets of sub-optimal measles vaccination coverage.<sup>3-5,8</sup> And while the measles vaccine is very safe and highly effective, it is not 100% effective: 2-5% of those who have received

one dose will get measles if exposed.<sup>9</sup> South Africa is a popular tourist and emigration destination, at high risk of imported measles cases. The probability of an unprotected person getting measles if exposed, is 90%.<sup>9</sup> While the children of the VASA parents will probably have a similar experience to USA children if they get measles, with "only" 14% of them being hospitalised and none of them dying, these children do not live in isolation like the American Amish. Their parents will surely take them to their doctor - even a mild case of measles makes a child feel miserable. While in the waiting room and for up to two hours afterwards, they will infect 90% of susceptible people.<sup>9</sup> And while shedding measles virus for four days before the rash appears, they will infect 90% of susceptible people they come into contact with - at home, crèche, nursery school, primary school, shopping centres, etc. Many of these people will be in the same socio-demographic stratum as the 1861 cases diagnosed by the Western Cape hospital in 2009-2010, and many will develop severe complications, and some will die. So this is the danger of vaccine refusal - that by a deliberate act of omission, vaccine refusers are implicit in causing disability and death in those, who given the choice, would opt for vaccination.

**References available on request.**

*\*Subsequent to this report, the death of an immunocompromised woman from Clallam County in Washington State was confirmed to be caused by measles.*

## WHYkids Meetings 2015

Region	Date	Topic	Speaker	Contact
Johannesburg North	12 August	TBA	TBA	Namisha Desai 082 601 9991
	9 September	TBA	TBA	
	14 October	TBA	TBA	
	11 November	TBA	TBA	
Bloemfontein	For information on future evens in this region, please contact: Izolde Viljoen - 079 492 8021			
Jhb East/South	For information on future evens in this region, please contact: Yingisani Baloyi - 060 961 9860			
Pretoria	21 August	TBA	TBA	Anel Sutherland - 082 788 3603
	17 September (Rustenburg)	TBA	TBA	
KwaZulu-Natal	For information on future evens in this region, please contact: Miranda Dlamini - 072 686 6224			
PE	For information on future evens in this region, please contact: Cecile du Preez - 082 572 9141			
Western Cape	TBA	TBA	TBA	Marian Mouton - 082 782 7855 or Maryke van der Merwe - 082 890 4493