

# Early vaccination might be crucial for growth and health of African children

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Credit: UNMEER/Aalok Kanani

Vaccination of African babies directly after birth seems favorable for their growth and health, while vaccination later in life may have negative effects. This is shown by analyses carried out by health researcher Mike Berendsen (Radboud University Medical Center) and Big Data expert Jeroen Smits (Radboud University), who analysed the medical data of more than 350,000 African children.

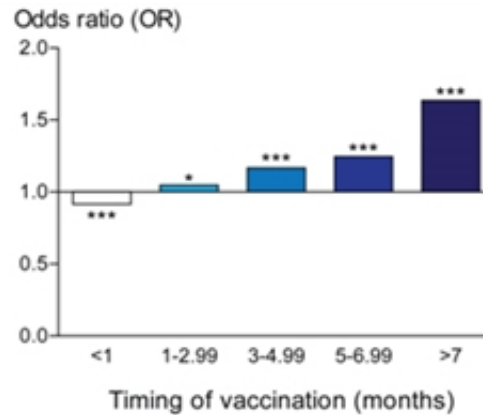
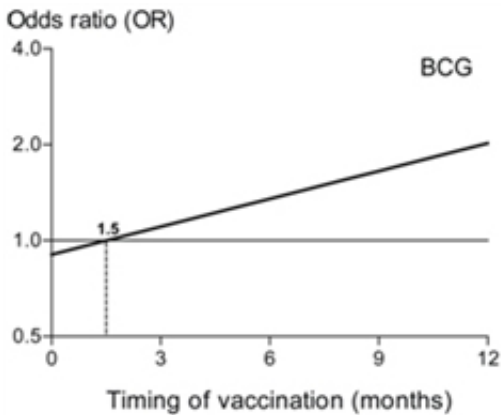
The analyses were carried out at Smits's Global Data Lab in cooperation

with medical specialists Mihai Netea and Andre van der Ven (Radboud University Medical Center). The team studied the effects of BCG vaccination (against tuberculosis), DTP vaccination (against diphtheria, tetanus and pertussis) and measles vaccination on growth and health of sub-Saharan African children under five.

Timing of vaccination was found to be important for all these vaccines: 'the sooner, the better' seems to be the motto for each of them. Early vaccination leads to lower odds on stunting (retarded growth) and also offers general health advantages. Findings also indicate that delayed vaccinations may be harmful. Mike Berendsen: "If this is true, it means that the present vaccination schedules have to be adjusted."

## **WHO regulations**

The findings of the Radboud researchers deviate from the WHO recommended schedules. WHO currently recommends administering BCG vaccine directly after birth, but in daily African practise BCG vaccination is often delayed. WHO also recommends to have DTP1 vaccine administered at 6 weeks and to have measles vaccine administered at 9 months. In Africa, these vaccinations are also often administered too late. Berendsen: "We can already achieve health gains by administering these vaccines on the recommended times, but possibly we may have to administer them all at birth. Of course, we first have to be sure that this does not negatively influence their effects on the diseases against which these vaccinations are given."



Time-dependent effects of BCG vaccination on stunting The effect of timing of BCG vaccination is shown for Sub-Saharan African children aged 1-60 months. The effect of vaccination shifts from positive (reduced risk of stunting) to negative (increased risk of stunting) at 1.5 months of age. Broken down into relevant time periods a similar trend is visible.

According to Berendsen, an important point of concern is the way in which vaccines are currently being administered in Africa: 1 ampoule contains BCG [vaccine](#) for 20 children. In practice, this means that the ampoule is only opened if there are enough children. This often leads to delayed vaccination. Fewer doses per ampoule would certainly make a difference.

## Big Data provides new insights

Jeroen Smits: "Because we have information on so many African children, who vary strongly in vaccination date and stunting, we are for the first time able to study the effect of timing of vaccination on health outcomes. This allowed us to gain fundamental new insight into the side effects of vaccination. In a regular study this would not have been possible, as [children](#) have to be vaccinated according to the WHO recommended schedule. Here you can see the strength of Big Data; it

makes it possible to discover unexpected patterns which you would not normally find."

## Follow-up study

Before definitive conclusions can be drawn, further research must be carried out. At the moment, Berendsen is involved in a follow-up study as a PhD candidate in Guinea-Bissau. "Because of our study we know with reasonable certainty that early vaccination has positive effects on the general [health](#) of babies. It is important to have this confirmed in different settings. That's what I am working on now."

**More information:** Mike L.T. Berendsen et al. Non-specific effects of vaccines and stunting: Timing may be essential, *EBioMedicine* (2016).  
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