

Measles confirmation and seroprevalence: addressing the challenges of sample collection and laboratory procedures

Céline Langendorf, Epicentre, France; Birgit Nikolay, Epicentre, France

Background

While case confirmation is most of the time not necessary for case management decisions – the measles outbreak response relies on the timely biological confirmation of outbreaks to facilitate a vaccination response. Seroprevalence estimates, on the other hand, can help plan vaccination activities or evaluate them, by quantifying immunization levels in the population. In remote areas where transport of serum or plasma samples is challenging, we ideally would like to use dried blood spots (DBS) which are easy to collect, easy to transport, and theoretically stable in time and temperature. However, the practical use of DBS under field conditions is not as easy as we expect. Based on different examples of measles surveys in the DRC and Niger, we will describe the challenges we are facing regarding interpretation of serology results from DBS for both measles biological confirmation and seroprevalence surveys.

Results and discussion

In the DRC, for biological confirmation, the sensitivity of DBS samples compared to plasma decreases with transport delays and is lower in remote settings. Measles seroprevalence based on DBS was lower than expected, raising questions about the use of the recommended seropositivity threshold and the correlation with seroprotection after vaccination. In Niger, we found that a good quality DBS can be obtained under field conditions, and an adjustment factor for DBS compared to serum is needed but may vary between settings.

Conclusion

Serology on DBS is the most acceptable procedure so far for biological confirmation of measles cases and seroprevalence. However, additional investigations are needed to better standardize, test, and interpret DBS samples to help making the most appropriate operational decisions.

Biological confirmation of outbreaks and seroprevalence estimates are the key components of measles control. Serology on dried blood spots is the most appropriate method but raises many challenges on interpreting the results.

