

## EFFECTIVENESS OF MEASLES SURVEILLANCE IN SOUTH WEST SHOA ZONE OF THE OROMIA REGION, ETHIOPIA

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Measles is one of the most contagious vaccine-preventable diseases and it is a major cause of child mortality in sub-Saharan Africa [1]. Repeated measles epidemics occurred between 2013 and 2017 in the South West Shoa Zone (SWSZ) of the Oromia Region in Ethiopia. A first outbreak was observed during the first months of 2013. Measles transmission was interrupted by a vaccination campaign conducted between May and June 2013. Immunization efforts were only partially effective in preventing measles circulation and sustained measles epidemics re-emerged in 2015, lasting up to March 2017. The high heterogeneity in the access to well-resourced hospitals has the potential of reducing the effectiveness of epidemic surveillance, which is still strongly dependent on clinical investigation of patients recovered in well-resourced hospitals [2]. It is therefore important to assess the ability of the surveillance system to measure the number of measles cases occurring in the community and to timely detect ongoing measles outbreaks. The proposed analysis provides quantitative estimates of possible delays and potential failures of the current surveillance system in detecting large measles epidemics in the future by using, a dynamic multi-patch transmission, calibrated on the time series of hospitalized measles cases. Model estimates obtained so far suggest that the surveillance system took about 4 months to detect an epidemic starting from the district where the central hospital is located. These results highlight a high risk that persistent silent transmission could characterize future measles outbreaks, undermining the potential containment of large epidemics.

### References

- [1] A Otten M., Kezaala R., Fall A., Masresha B., Martin R., Cairns L., et al. (2005). *Public-health impact of accelerated measles control in the WHO African Region 2000-03*. *Lancet*, 366:9488.
- [2] Poletti P., Parlamento S., Fayyisaa T., Feyyiss R., Lusiani M., Tsegaye A., et al. (2018). *The hidden burden of measles in Ethiopia: how distance to hospital shapes the disease mortality rate*. *BMC Medicine*, 16:177.