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Global burden of meningitis, understanding modelling estimates and the Meningitis Progress Tracker

Claire Wright, Meningitis Research Foundation

WHO recently launched the Defeating Meningitis by 2030 initiative. The scope includes organisms considered to be the leading causes of acute bacterial meningitis, and for which vaccines are either available or likely to become available in the next few years.

As a result of limitations in country-specific health data in many low and middle income countries, there is a heavy reliance on global health estimates to track progress in global health initiatives. We aimed to define the current global burden of meningitis caused by *Neisseria meningitidis* (Nm), *Streptococcus pneumoniae* (Spn), *Haemophilus influenzae type b* (Hib) using two major global modelling efforts so that progress can be monitored over time. Meningitis estimates from the Institute for Health Metrics and Evaluation GBD2017 and Maternal Child Epidemiology Estimation (MCEE)/ Johns Hopkins School of Public Health (JHSPH) Child Mortality estimates: syndromic and meningitis pathogen models were compared.

The comparison demonstrated that:

- There were considerable differences in under 5 meningitis/encephalitis mortality estimates between the different modelling efforts, with GBD 2017 and MCEE/JHSPS estimating around 190,000 and 142,000 deaths globally in 2015 respectively.
- GBD 2017 estimated higher global incidence of pathogen specific meningitis in 1-59 month olds in 2015 than MCEE/JHSPH. GBD2017 estimated an incidence of 34/100,000, 31/100,000 and 40/100,000 for meningococcal, Hib and pneumococcal meningitis respectively compared to MCEE/JHSPH's estimate of 5/100,000 and 12/100,000 for Hib meningitis and pneumococcal meningitis respectively.
- Global mortality and proportions of meningitis deaths attributable to Spn and Hib in children aged 1-59 months also differed substantially between GBD2017 and MCEE/JHU estimates
- A high proportion of global child deaths (over 90% in one model) are based on verbal autopsy data leading to considerable uncertainty in these estimates

Lack of alignment in the estimates has led to the recommendation that to measure progress towards the defeating meningitis by 2030 initiative, multiple estimates and surveillance sources should be tracked in parallel over time. Meningitis Research Foundation have created the Meningitis Progress Tracker to allow estimates of global cases and deaths from meningitis to be tracked from multiple sources. The tracker has been aligned to the five pillars of the roadmap: Prevention, Surveillance, Diagnosis and Treatment, Support and Aftercare, and Advocacy. Users can interact with the site to create the visualisations most relevant to them and their work. Visualisations can be created which will show country, regional and globally specific estimates and trends over time.

Access the tracker at <https://www.meningitis.org/meningitis/meningitis-progress-tracker>