Impact of the Hepatitis B Vaccine Birth-Dose on Perinatal Incidence between 2017-2050: Results from 17 WHO AFRO Countries

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INTRODUCTION

- Expanding access to the hepatitis B (HBV) vaccine birth-dose (BD) is recommended as an essential step towards preventing mother-to-child transmission (MTCT) of the virus as well as in elimination efforts [1-2].
- This is particularly the case in the World Health Organization Africa Region (WHO AFRO) where BD coverage is low and perinatal HBV incidence is high [2].
- Few analyses exist, however, which investigate the impact of administering BD on future perinatal incidence.

AIM

- Use a modeling approach to describe perinatal HBV incidence from 2017 - 2050 in 17 WHO AFRO countries (Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Ethiopia, Gabon, Gambia, Kenya, Madagascar, Malawi, Nigeria, Rwanda, Senegal, Tanzania, Uganda, Zimbabwe).
- Consider the impact of BD on future perinatal incidence.

METHOD

- The PRoGReSs Model is a dynamic HBV transmission and progression model that predicts the future prevalence and the impact of prophylaxes and treatment on the disease burden [3].
- 17 country models were seeded with published, expert verified, and/or extrapolated epidemiology data related to serological prevalence, diagnosis, vaccination and treatment [4].
- The base model assumes no change in the country's current BD coverage, with other parameters set to meet WHO 2030 targets for 5 year olds [5].
- The test model increased BD coverage between 2017 and 2030 to match WHO target 3D coverage by 2030. The difference in perinatal incidence between 2017 and 2050 was then calculated.

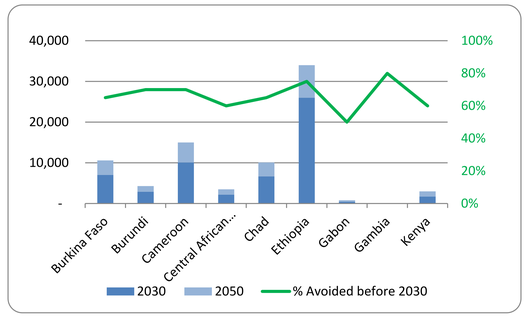
RESULTS

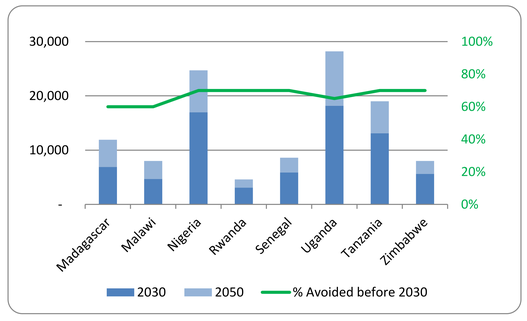
- Expanding BD to match 3D rates for WHO targets by 2030 in these 17 countries, results in ~ 200,000 total incident perinatal HBV cases avoided between 2017 and 2050.
  - This ranged from 15 cases in The Gambia to ~34,000 cases in Ethiopia.
  - Over 60% of all incident cases prevented occurred before 2030.
  - Cameroon, Ethiopia, Nigeria, Tanzania and Uganda each prevented over 10,000 incident perinatal cases by 2030.

Table 1. Change in Base and Test model BD coverage

	Base Model			Test Model		
	3D Coverage (2030)	Treated Mothers (2030)	BD Coverage (2030)	3D Coverage (2030)	Treated Mothers (2030)	BD Coverage (2030)
Burkina Faso	99%	80%	0%	99%	80%	99%
Burundi	99%	70%	0%	99%	70%	99%
Cameroon	99%	85%	0%	99%	85%	99%
CAR	99%	99%	0%	99%	99%	99%
Chad	99%	99%	0%	99%	99%	99%
Ethiopia	96%	90%	0%	96%	90%	96%
Gabon	99%	65%	0%	99%	65%	99%
Gambia	99%	99%	96%	99%	99%	99%
Kenya	81%	0%	0%	81%	0%	81%
Madagascar	99%	50%	0%	99%	50%	99%
Malawi	91%	0%	0%	91%	0%	91%
Nigeria	99%	99%	54%	99%	99%	99%
Rwanda	99%	0%	0%	99%	0%	99%
Senegal	99%	80%	0%	99%	80%	99%
Uganda	99%	70%	0%	99%	70%	99%
Tanzania	99%	50%	0%	99%	50%	99%
Zimbabwe	99%	75%	0%	99%	75%	99%

Figure 1. Number and Proportion of Incident Perinatal Cases Avoided (2030 and 2050)





CONCLUSIONS

- MTCT remains an important global health problem with over 40% of infants born to infected mothers acquiring HBV infection perinatally [6].
- Expanding access to the hepatitis B (HBV) vaccine BD in the next 15 years will lead to significant reductions in incident perinatal HBV cases by 2050.
- This suggests that in the long term, the persistent lack of a BD will lead to more perinatal cases and hence more chronic cases.

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