**Supplementary table 1.** Research questions on paediatric HIV testing, treatment and service delivery ranked in order of Research Priority Scores (RPS)

| Rank | Research question | Research types | Answerability score | Impact score | Implementation score | Equity score | Research Priority Score\* | Average Expert Agreement\*\* |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| HIV TESTING | | | | | | | | |
| 1 | What is the optimal placement and the impact of point-of-care early infant diagnosis on the rates of ART initiation among infants and children living with HIV? | Development | 93 | 90 | 85 | 89 | 89,4 | 79 |
| 2 | What interventions ensure timely linkage between HIV diagnosis and treatment and care for infants and children living with HIV? | Delivery | 89 | 87 | 87 | 88 | 87,7 | 76 |
| 3 | What are novel diagnostic tools that are optimized for point of care (such as smaller size and battery compatible) that can be developed and validated to provide accurate results for birth testing and recent infection of HIV exposed infants? | Discovery | 91 | 90 | 80 | 85 | 87,3 | 75 |
| 4 | What interventions or strategies improve access and uptake of early infant diagnosis for infants living with HIV? *These may include, but are not limited to, m-health platforms, family testing, integrated services, and community engagement etc.* | Development | 87 | 86 | 86 | 89 | 87,0 | 75 |
| 5 | What community based approaches are effective in identifying undiagnosed HIV positive infants and children? | Development | 88 | 85 | 82 | 84 | 84,7 | 70 |
| 6 | What factors enable or hinder timely initiation of ART among infants and children infected with HIV and subsequent linkage to care? | Delivery | 84 | 83 | 83 | 86 | 83,9 | 69 |
| 7 | What testing strategies at entry points other than antenatal care (ANC) and the labour ward are effective, feasible and acceptable in identifying undiagnosed HIV positive infants and children, in different epidemic settings?  *Strategies may include, but are not limited to, screening tools for targeted testing, HIV testing integration with birth registration, vaccination, and preschool services etc.* | Delivery | 85 | 82 | 82 | 82 | 82,8 | 69 |
| 8 | What strategies or interventions are effective at improving uptake and retention in care of HIV exposed uninfected infants and children? | Delivery | 88 | 82 | 80 | 77 | 81,9 | 66 |
| 9 | What is the effectiveness, acceptability, and feasibility of routine birth testing on the identification of undiagnosed HIV positive infants and their initiation on ART? | Delivery | 85 | 80 | 74 | 82 | 80,0 | 65 |
| 10 | What are the factors that enable or hinder access and uptake of HIV testing services by parents and caregivers (including those from key populations) for infants and children exposed to HIV? *Factors may include, but are not limited to, age, gender, distance from the health facility, disclosure status, and service entry points etc.* | Descriptive | 81 | 79 | 74 | 81 | 78,9 | 61 |
| 11 | In the context of maternal ART during pregnancy and breastfeeding, what is the sensitivity and specificity of early infant testing approaches on the identification of undiagnosed HIV positive infants? | Discovery | 84 | 80 | 76 | 73 | 78,5 | 60 |
| 12 | What clinical management, monitoring and surveillance strategies for HIV exposed uninfected infants and children are effective in improving health and programmatic outcomes? | Discovery | 84 | 78 | 77 | 71 | 77,7 | 63 |
| 13 | In the context of maternal ART, do HIV-exposed uninfected children have a higher risk of adverse short, medium to long term health outcomes compared to HIV non-exposed children? *These may include, but are not limited to, effects on short to medium outcomes such as growth and early child development and effects on long term outcomes such as non-communicable diseases, metabolic syndromes, neurocognitive development, fertility etc. In addition to quality of life, psychosocial and educational outcomes.* | Descriptive | 82 | 69 | 61 | 66 | 69,8 | 54 |
| 14 | How can parents or caregivers be supported to effectively deliver HIV self-tests to their children (>18 months of age) who may be at high risk of HIV infection from maternal to child transmission (MTCT)? | Delivery | 67 | 71 | 66 | 71 | 69,5 | 49 |
| 15 | In the context of maternal ART, what are the rates and correlates of mortality and morbidity outcomes (short and long term) among HIV exposed uninfected children compared to non-exposed children? *Consider underlying biological and immunological mechanisms.* | Descriptive | 77 | 70 | 66 | 63 | 69,1 | 52 |
| 16 | In the context of maternal ART, what are correlates of HIV infection among infants and children? *These may include, but are not limited to, transmission patterns, incidence of HIV infection, geographic differences, and late maternal seroconversions etc.* | Descriptive | 72 | 66 | 65 | 69 | 67,6 | 49 |
| HIV TREATMENT | | | | | | | | |
| 1 | What are the safety, efficacy and pharmacokinetic profiles of new anti-retroviral drugs, drug classes and formulations to be used in infants and children living with HIV? *Consider addressing specific issues such as maternal/transmitted HIV drug resistance, harmonisation with maternal ARV regimens, acceptability and feasibility of paediatric formulations in LMICs, ARV central nervous system penetration etc.* | Discovery | 91 | 92 | 77 | 85 | 87,6 | 75 |
| 2 | What are effective strategies or interventions to improve adherence among infants and children on ART? *These may include, but are not limited to, mental health tools, monitoring strategies, family focused health systems, innovative technologies including mobile phone platforms etc.* | Development | 90 | 86 | 86 | 86 | 86,8 | 75 |
| 3 | How to optimise ARV dosing for infants and children living with HIV? *This may include, but is not limited to, validation of fixed dose combination dosing (FDC) and current modelling approaches, as well as the impact of drug interactions and health status (such as malnutrition or diarrheal disease) on efficacy.* | Development | 86 | 88 | 84 | 85 | 86,2 | 75 |
| 4 | What is the safety, efficacy and, acceptability of novel drug delivery systems to improve treatment outcomes in infants and children living with HIV? *These include but, are not limited to, long-acting or extended release delivery systems for example a single dose regimen (injection) or continuous dosing regimen (implant, transdermal patch, optimization of oral formulations etc.).* | Discovery | 90 | 91 | 75 | 83 | 86,1 | 71 |
| 5 | How to optimise the prevention and/or clinical management of co-infections, particularly tuberculosis, for infants and children living with HIV to improve clinical outcomes? | Discovery | 88 | 86 | 81 | 81 | 84,3 | 69 |
| 6 | What are the individual, family, programmatic and structural factors that enable or hinder adherence and virological suppression (or treatment failure) among infants and children on ART? | Delivery | 88 | 81 | 77 | 78 | 81,0 | 64 |
| 7 | What is the impact of HIV infection and/or ART exposure on short to long term outcomes among infants and children living with HIV? *These may include, but are not limited to, prevalence and outcomes of non-communicable disease outcomes (cardiovascular, respiratory, metabolic), developmental outcomes (physical-, neuro-, psycho- and sexual development), disease progression and mortality, in addition to quality of life, psychosocial and educational outcomes etc.* | Descriptive | 91 | 82 | 72 | 75 | 80,6 | 63 |
| 8 | What is the optimal frequency of viral load monitoring to prevent and identify virological failure among children on ART? | Development | 83 | 81 | 75 | 77 | 79,5 | 63 |
| 9 | What are the patterns and correlates of HIV drug resistance among infants and children living with HIV? | Descriptive | 88 | 80 | 72 | 72 | 78,5 | 61 |
| 10 | What are the short and long term virologic and immunologic response outcomes of starting treatment early in infants living with HIV? | Discovery | 84 | 78 | 74 | 77 | 78,2 | 64 |
| 11 | What simplified screening tools can be developed and validated to assess the risk of treatment failure infants among infants and children living with HIV? | Delivery | 85 | 77 | 73 | 78 | 78,2 | 63 |
| 12 | What are the surrogate markers of HIV reservoirs and the innovative therapeutic strategies to control HIV reservoirs in order to achieve a functional cure for infants living with HIV? | Discovery | 88 | 84 | 57 | 72 | 77,0 | 63 |
| 13 | What are the optimal approaches to treatment sequencing for children living with HIV? | Development | 80 | 79 | 70 | 75 | 76,8 | 57 |
| 14 | What are the best immunisation strategies for infants and children living with HIV? These may include, but are not limited to, revaccination, novel vaccinations or maintaining standard vaccination strategies. | Discovery | 82 | 77 | 77 | 70 | 76,6 | 59 |
| 15 | What are the optimal screening tools and effective strategies or interventions to prevent and minimise the impact of non-communicable diseases among infants and children living with HIV? | Discovery | 84 | 78 | 69 | 68 | 75,8 | 58 |
| 16 | What is the prevalence of opportunistic and co-infections among infants and children living with HIV? *Especially with regards to tuberculosis and hepatitis.* | Descriptive | 79 | 68 | 66 | 69 | 70,5 | 52 |
| 17 | Strategies to control immune activation among infants and children living with HIV? | Discovery | 79 | 73 | 63 | 63 | 70,4 | 58 |
| 18 | What are the markers and correlates of immune activation and their impact on clinical outcomes? | Discovery | 82 | 73 | 57 | 59 | 69,0 | 54 |
| 19 | How does the age of ART initiation effect and predict short and long term outcomes? *These may include, but are not limited to, non-communicable disease incidence, neurodevelopment, comorbidities, mortality, survival, retention, and adherence etc.* | Descriptive | 74 | 67 | 64 | 66 | 67,7 | 47 |
| 20 | What is the impact of planned treatment interruption (weekends off/ treatment holidays) on clinical outcomes for children living with HIV and what strategies allow for safe treatment interruption? | Descriptive | 75 | 70 | 65 | 58 | 67,6 | 51 |
| 21 | What are the key characteristics and determinants of paediatric elite controllers and how can they be identified and managed? | Descriptive | 79 | 70 | 52 | 53 | 65,0 | 54 |
| HIV SERVICE DELIVERY | | | | | | | | |
| 1 | What are effective strategies or interventions to improve access, uptake and retention in care among infants and children living with HIV? *Consider strategies or interventions at the programmatic, facility, individual, and community level for different age groups.* | Development | 92 | 90 | 88 | 87 | 89,7 | 79 |
| 2 | What service delivery models are effective in improving the health and programmatic outcomes of infants and children (including orphans) along the HIV cascade? *Service delivery models may include, but are not limited to, decentralisation, specialised paediatric clinics, family centered care models, community based delivery, and differentiated service delivery etc.* | Delivery | 92 | 83 | 83 | 87 | 85,7 | 73 |
| 3 | What are effective family support strategies or interventions that ensure appropriate care and support of infants and children living with HIV? *This may include, but is not limited to, social protection and economic support, training and skills development etc.* | Development | 94 | 85 | 78 | 79 | 84,2 | 70 |
| 4 | What are effective psychosocial support strategies or interventions for children living with HIV to improve health, wellbeing and programmatic outcomes? | Development | 87 | 85 | 75 | 77 | 82,0 | 65 |
| 5 | What are the rates and patterns of lost to follow up and the factors that enable or hinder infants and children living with HIV to access, uptake, and be retained in services? *Consider individual, structural and programmatic factors.* | Descriptive | 86 | 79 | 71 | 78 | 78,9 | 60 |
| 6 | What strategies or interventions can be implemented to improve and support parents, caregivers and health care providers to facilitate HIV disclosure to children living with HIV? | Development | 85 | 77 | 79 | 74 | 78,5 | 61 |
| 7 | What are the factors that enable or hinder HIV disclosure to children living HIV? | Descriptive | 87 | 76 | 76 | 75 | 78,3 | 64 |
| 8 | How to effectively integrate comprehensive HIV treatment and care into the MCH services delivery platforms to improve outcomes among infants and children living with HIV? | Delivery | 83 | 76 | 75 | 79 | 77,9 | 60 |
| 9 | What are effective strategies or interventions to reduce stigma and discrimination experienced by children living with HIV and their caregivers? *Consider different settings such as community, home, health facilities, and education system.* | Development | 84 | 74 | 74 | 81 | 77,5 | 60 |
| 10 | What is the prevalence of disability, including learning disabilities, among children living with HIV and what interventions or strategy can effectively improve their health outcomes? | Development | 87 | 78 | 67 | 72 | 76,8 | 63 |
| 11 | What is the level of stigma and discrimination experienced by children living with HIV and their caregivers in different settings and its impact on child health, educational and programmatic outcomes? *Consider settings such as the community, home, health facilities, and education system etc.* | Development | 81 | 73 | 71 | 76 | 74,8 | 57 |
| 12 | What are the knowledge, attitudes and practices of health care providers in providing comprehensive treatment, care and support to infants and children living with HIV? | Development | 75 | 71 | 71 | 71 | 71,7 | 50 |
| 13 | What are the optimal nutritional supplementations to improve health outcomes among infants and children living with HIV? | Discovery | 75 | 71 | 66 | 66 | 69,8 | 49 |
| 14 | What is the impact of different types of violence on the health outcomes of children living with HIV and how can these be appropriately and effectively addressed? | Descriptive | 74 | 69 | 62 | 67 | 68,2 | 51 |

\*Research Priority Score (RPS) is the mean score given across criteria (answerability, impact, implementation and equity) and scorers for each research question, weighted according to published guidelines from CHNRI stakeholders and adjusted to a 100-point scale.

\*\*Average Expert Agreement (AEA) is the average proportion of scorers that agreed on responses for each of the four criteria of answerability, impact, implementation and equity.