Highlights from Phase 1 and Phase 2
Linking Evidence of Children's Risk and Resilience in the Age of HIV to the Science of Child Development

PHASE 1: Risk and Children Affected by HIV/ AIDS

All children, especially very young children, rely on adults for protection, care, developmental stimulation, nutrition, and healthcare access. HIV/AIDS is most prevalent among adults in their reproductive years, resulting in far-reaching implications for children. Infected adults are often parents or are responsible for or involved in the care of children. HIV taxes the standard of care adults are able to provide, particularly when coupled with poverty.

Over the past decade, a great deal has been learned about the implications of adult HIV for children to try and understand which children are more vulnerable and why. Although risks do not inevitably lead to harm, numerous studies of children affected by HIV have observed that often risks do lead to harm, at least in the short term with potentially long-term implications. Areas of risk identified in the Phase 1 literature review[1] are summarized below.

Psychological adjustment
Conclusive evidence from several systematic reviews, demonstrates that parental HIV is associated with child psychological distress including g heightened rates of depression and post-traumatic stress reactions compared to children who are not orphaned, and also compared to children whose parents died of other causes. More recently, studies found heightened rates of depression, post-traumatic stress and anxiety among children whose primary caregivers were alive but unwell with symptomatic AIDS

Cognitive impacts
Two recent systematic reviews showed some form of cognitive delay in children both infected and affected by HIV. All domains of development are implicated, including expressive and receptive language, memory, information processing, visual-spatial tasks, executive functioning and decision-making.

Nutrition
Exposure to HIV has been linked both with low birth weight and slower early growth. While these losses are sometimes recovered within the first year, risks associated with economic strain as a result of HIV and other factors may persist.

Schooling
A systematic review found specific educational effects of family HIV, including disadvantage in school enrollment and attendance, school behavior, performance, completion and educational attainment.

Exposure to violence
HIV-infected women are disproportionately subjected to various forms of verbal, physical and sexual abuse. Children in AIDS-affected families have been shown to endure a threefold higher level of abuse. Two studies in sub-Saharan Africa clearly identify child abuse as a link to future HIV infection.

[1] Please see http://journals.lww.com/aidsonline/toc/2014/07001 for the full text of the articles summarized in this paper.

Sexual health
Research from sub-Saharan Africa has consistently linked orphanhood and parental AIDS illness with HIV sero-prevalence and HIV risk behaviors among youth. Whereas a portion of this association might be explained through vertical transmission, a positive relationship between orphanhood and risk behaviors also appears likely. Trends across some included studies showed elevated reports of sexual risk behaviors among orphans compared to non-orphans, including higher likelihood of girls' unprotected sexual intercourse, multiple lifetime partners, forced or unwilling sex, transactional sex and earlier sexual debut.

PHASE 2: Long-term outcomes of childhood adversity addressed in the broader child development literature

Over the course of more than 100 years, the science of children's development has built up a formidable body of evidence. Utilizing a wide range of methodologies, naturalistic and experimental, as well as longitudinal and cohort studies, we now understand how children develop and what affects their development. This science was used in Phase 2 to better understand the short and long-term implications of HIV/AIDS for children, and how best to protect them from harm, and to mitigate harm should it occur. Specific harms to children drawn from the broader evidence-base of children in adverse contexts are summarized below.

Disruptions of the parent–child relationship
Parent availability and well-being are fundamental to child development and thus strong predictors of child well being, especially in times of adversity. Without love and acceptance from a parent (or an alternative primary caregiver), it is extremely difficult for children to cope with adversity. HIV/AIDS can lead to parents and caregivers facing a range of adversities, including physical illness, emotional strain, financial pressures and social disruptions. If families do not have the emotional, social and material resources to cope with these adversities, their children are more likely to suffer negative consequences.

Parental death
Parental loss can lead to child depression, higher rates of accidents, poor school performance, anxiety and pessimism about the future. Some of these negative consequences can continue into adulthood in the form of higher levels of anxiety, depression and hostility.

Parental mental health
An HIV diagnosis can lead to multiple adult mental health problems. Mental health disorders in parents and caregivers are associated with an increase in psychological and developmental disturbances in children, including in the longer term. Three domains of child development are at risk: attention and cognition; emotional/ behavioral adjustment, including depression and antisocial behavior; and attachment or the quality of the parent–child relationship.

Attachment and institutional care
Despite evidence of harm, the number of orphanages in HIV-affected countries continues to grow. The nature of orphanages generally prevents children from forming a close relationship with at least one stable caregiver. Such relationships are central to children's healthy development, and despite an abundance of food, orphans often fail to thrive. This is particularly true for young children.

Violence against children
Children affected by HIV have been shown to be at increased risk of exposure to violence, including abuse. There is strong evidence supporting connection between exposure to violence and long-term negative outcomes,

including risks of injury, infectious diseases, mental health problems, reproductive health problems, and non-communicable diseases. Childhood exposure to violence is associated with risky sexual behavior later in life. Child maltreatment and exposure to intimate partner violence in girls is associated with earlier sexual debut, an increased number of sexual partners and higher rates of teen pregnancy.

Growth and development

The impact of caregiver HIV/AIDS on child growth in the early years of life may have major long-term consequences. There is a close association between early nutrition and both short and long-term human capital outcomes. The first 1000 days are particularly important because it is a period of rapid brain, psychological and physiological development. Inadequate nutrition during this period results in slower linear growth and delayed psychosocial development.

A number of other factors associated with being affected by HIV/ AIDS have the potential to limit children's growth and development. Children may acquire HIV through prenatal exposure or breast feeding, which can affect their growth. HIV-exposed, but uninfected children, are also at increased risk of adverse outcomes, in part, because of their potential rearing environment, but also because exposure *in utero* to HIV affects immune function and increases the risk of perinatal problems, including low birth weight and subsequent growth.

Common Insights on Risk and Resilience for Program, Policy and Practice

Multiple stressors (including of the type experienced by HIV-affected children) can lead to serious long-term negative outcomes when combined, suggesting that we should be much more concerned about long-term outcomes for children affected by multiple risks than is currently the case.

The prevention of adverse effects through protection, and the mitigation of their effects through affectionate and stable family relationships, social support and normalization can make a critical difference to a child's ability to cope. Enabling affected children to enter adolescence and the period of risk for HIV infection with protection support and resilience is an indispensable aspect to ensuring 'the end of AIDS'.

Universal policies and programs designed to support families' capacity to protect and nurture children and improve child-rearing conditions help shield children from the worst effects of hardship resulting from HIV/AIDS. In the context of high HIV prevalence, these include efforts to strengthen families economically through cash transfer programs, health insurance, savings initiatives and livelihood activities.

To date, research on children affected by HIV/AIDS has been limited to impacts over the short term. Longer-term follow-up and cohort studies in LMICs are urgently needed to better understand the nature, duration and extent of impacts on children. However, the absence of evidence of long-term negative implications of childhood adversity associated with HIV/AIDS should not be interpreted as evidence that these long-term negative implications do or will not occur. While we wait for better data, we can draw on the knowledge we have in other areas of child development, which, although not directly transferable to the context of HIV and AIDS-related childhood adversity, is highly informative.

The President's Emergency Plan for AIDS Relief (PEPFAR)/United States Agency for International Development (USAID)-commissioned two background studies on the evidence of the consequences of HIV/AIDS on affected children. The first study, or Phase 1, examined the evidence of impact: health, psychological and social effects of adult HIV on children. This summary then informed the development of Phase 2, which drew from the broader child development literature to shed light on the long-term outcomes for children affected by AIDS. Both of these evidence reviews then led to the development of an initial model which begins to help us predict the long-term consequences for the millions of children affected by HIV and AIDS. ***For further information on phase 1 and phase 2 please refer to AIDS 28 (suppl 3):S261-S268. http://journals.lww.com/aidsonline/toc/2014/07001***