Mother-to-child transmission of human immunodeficiency virus type 1 (HIV-1) is a significant problem in countries with endemic HIV-1 infection. Between 1986 and 1991, 365 children of HIV-1-infected mothers and 363 control children were studied in Kenya. The overall risk of transmission from mother to child, determined by serologic evidence of infection by age > or = 12 months and excess mortality in the HIV-1-exposed group, was 42.8% (range, 27.6%-62.2%). Marriage was the only maternal characteristic associated with transmission (odds ratio, 2.2; 95% confidence interval, 1.2-4.2; P < .05). Children who experienced growth failure were more likely to be infected. In 44% of children ultimately infected, the pattern of antibody response implied intrapartum or postnatal exposure to HIV-1. Of potential postnatal exposures examined, duration of breast-feeding beyond age 15 months and the mother being married were independently associated with increased risk of infection and seroconversion of children. The percentage of HIV infection attributable to breast-feeding > or = 15 months was 32%. The frequency of mother-to-child transmission of HIV-1 was high; a substantial proportion of infection occurred postnatally, possibly through breast-feeding.