Children followed in the TEDDY study are diagnosed with type 1 diabetes at an early stage of disease.

The Environmental Determinants of Diabetes in the Young (TEDDY) study is designed to identify environmental exposures triggering islet autoimmunity and type 1 diabetes (T1D) in genetically high-risk children. We describe the first 100 participants diagnosed with T1D, hypothesizing that (i) they are diagnosed at an early stage of disease, (ii) a high proportion are diagnosed by an oral glucose tolerance test (OGTT), and (iii) risk for early T1D is related to country, population, human leukocyte antigen (HLA)-genotypes and immunological markers. Autoantibodies to glutamic acid decarboxylase (GADA), insulinoma-associated protein 2 (IA-2) and insulin (IAA) were analyzed from 3 months of age in children with genetic risk. Symptoms and laboratory values at diagnosis were obtained and reviewed for ADA criteria. The first 100 children to develop T1D, 33 first-degree relatives (FDRs), with a median age 2.3 yr (0.69-6.27), were diagnosed between September 2005 and November 2011. Although young, 36% had no symptoms and ketoacidosis was rare (8%). An OGTT diagnosed 9/30 (30%) children above 3 yr of age but only 4/70 (5.7%) below the age of 3 yr. FDRs had higher cumulative incidence than children from the general population (p< 0.0001). Appearance of all three
autoantibodies at seroconversion was associated with the most rapid development of T1D (HR = 4.52, p = 0.014), followed by the combination of GADA and IAA (HR = 2.82, p< 0.0001). Close follow-up of children with genetic risk enables early detection of T1D. Risk factors for rapid development of diabetes in this young population were FDR status and initial positivity for GADA, IA-2, and IAA or a combination of GADA and IAA.