# **Economic evaluation of potential national childhood screening strategies for type 1 diabetes in Australia**

**Aim:** Population-wide screening for type 1 diabetes (T1D) in children is being proposed in Australia and worldwide to prevent diabetic ketoacidosis (DKA) at diagnosis and it’s multiple sequelae. We aimed to investigate the costs and cost-effectiveness of potential national childhood screening strategies for T1D compared to no screening (usual care).

**Methods:** Screening costs were obtained from trial-based estimates with effectiveness expressed as quality adjusted life years (QALYs). A Markov microsimulation model was developed to identify the most cost-effective childhood T1D screening strategy. The three screening strategies modelled were: Strategy 1) newborn genetic risk-stratification with bloodspot sampling, followed by autoantibody screening in at-risk children; Strategy 2) infant genetic risk-stratification using saliva sampling, followed by autoantibody screening in at-risk children; Strategy 3) population-wide autoantibody screening at two childhood ages. The model tracked 100,000 individuals from birth to 30 years of age. One-way and probabilistic sensitivity analyses were conducted.

**Results:** Bloodspot genetic risk-stratified screening (strategy 1) was the most cost-effective strategy. Incremental cost-effectiveness ratios (ICERs) were $50,682 per QALY gained for strategy 1, $85,440 per QALY gained for strategy 2, and $133,285 per QALY gained for strategy 3. In the optimal strategy (strategy 1), the cost was $480,798 per screen-detected T1D and $12,183 per episode of DKA avoided. Results were sensitive to changes in time horizon, discount rates, and cost of the screening tests.

**Conclusion:** Of the three modelled T1D screening strategies, bloodspot genetic risk-stratified screening was the most cost-effective. Varying cost inputs may change this hierarchy. Our economic evaluation will be useful for informing future T1D childhood screening policy in Australia.