CLOSER LOOK

MEMORANDUM

Diabetes Care publishes study on cost-effectiveness of general versus targeted population T1D screening – March 3, 2026

Population-wide screening delivers the highest rates of detection but also incurs high incremental costs of $11K-$25K per case detected

Diabetes Care just published an article by Dr. Shweta Mital (University of Manitoba, Canada) et al. on the cost-effectiveness of T1D screening in the general vs. targeted population in Canada. The study found that general population screening for T1D detects a greater proportion of at-risk children than strategies limited to those with a family history or high genetic risk, but it also requires substantially higher spending per diagnosed case.

While the incremental cost per case detected was higher for general population screening than family history-based screening, the authors noted that the cost-effectiveness ratio was comparable to other pediatric screening programs.

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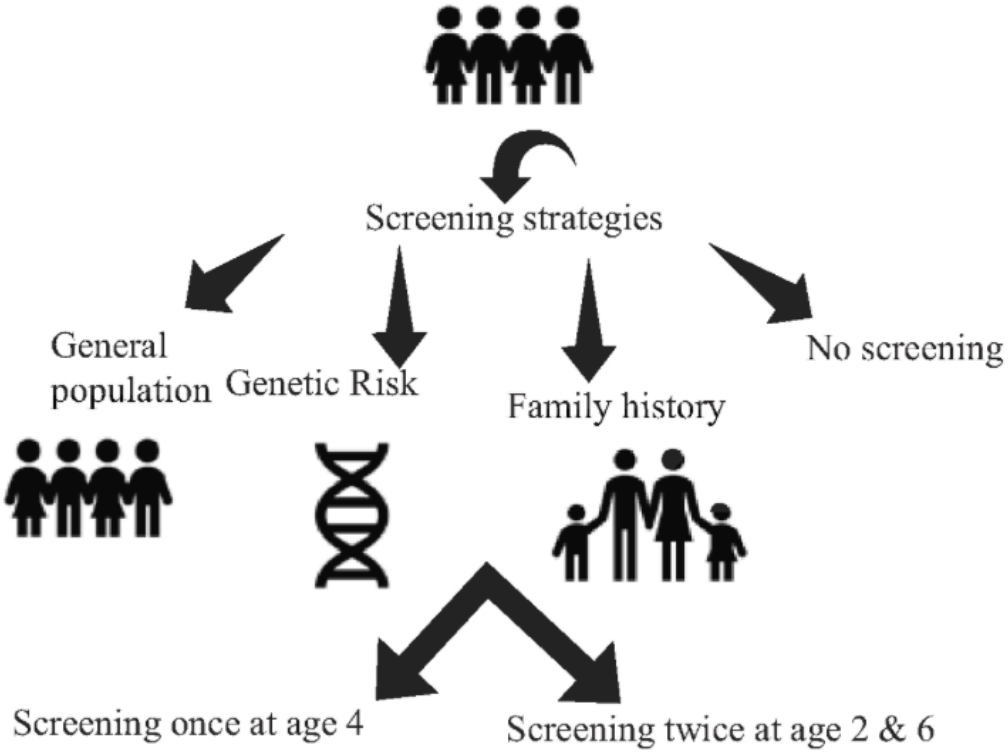
Study design explores seven different screening strategies

The study used a hybrid decision tree-Markov model[1], following 10,000 Canadian children from birth to age 15 across seven screening strategies:

- General population screening for all children at age four;
- General population screening for all children at ages two and six;
- General population screening at birth, followed by autoantibody testing at age four for those at high risk due to family history or genetic risk;
- General population screening at birth, followed by autoantibody testing at ages two and six for those at high risk;
- Testing at age four for children with a first-degree relative with T1D;
- Testing at ages two and six for children with a first-degree relative with T1D; and
- No screening.

Effectiveness was defined as the number of children identified with at least one autoantibody before clinical onset, while costs included screening, confirmatory testing, follow-up monitoring, and DKA management. The model assumed that 1% of children would seroconvert (have one or more autoantibodies) over childhood and that screening reduced DKA risk by 89% compared with no screening.

Figure 1. Seven different screening strategies for T1D detection



General population screening is most effective at detecting cases

General population screening generated the highest yield in terms of case detection but also the highest total costs in the context of the Canadian health system. Screening all children in the hypothetical cohort of 10,000 once at age four cost[2] $559,116 (~$415,000 USD) and identified 56 at-risk cases, while screening at ages two and six cost $1,021,795 (~$760,000 USD) and identified 74 cases. These strategies also reduced modeled DKA events from 10 with no screening to five and four events, respectively.

Family history-based strategies were far less expensive, costing $118,073 (~$88,000 USD) to screen at age four and $154,582 ($115,000 USD) at ages two and six, but detected only 16-21 cases and was estimated to have prevented just one to two DKA events. Genetic-risk-based strategies were the most costly, exceeding $2.1 million (~$1.55 million USD) per 10,000 children, yet detected only 20-26 cases. Incremental cost-effectiveness ratios (ICERs) highlight the trade-offs across strategies.

- Family-history screening at age four costs $2,597 (~$1,930 USD) per case detected, compared with no screening;
- Screening at ages two and six cost $7,479 (~$5,560 USD) per additional case detected;
- General population screening cost $11,383 (~$8,470 USD) per case detected at age four (vs. family-history screening at ages two and six) and $25,923 (~$19,300 USD) for screening at ages two and six (vs. screening at age four).

See the table below for the full comparison.

Table 1. Cost-effectiveness of various screening strategies

Table 1—Base case results

	Total screening & monitoring costs (C$)	Total DKA management costs (C$)	Total costs (C$)	No. of at-risk cases detected via screening	Modeled no. of DKA cases at disease onset	Incremental cost-effectiveness ratio (C$/at-risk case detected)
No screening	—	76,836	76,836	—	10	—
Family history-based screening at age 4	51,868	66,205	118,073	16	9	2,597
Family history-based screening at ages 2 and 6	91,825	62,757	154,582	21	8	7,479
General population screening at age 4	517,043	42,073	559,116	56	5	11,383
General population screening at ages 2 and 6	992,101	29,694	1,021,795	74	4	25,923
Genetic risk-based screening at age 4	2,059,907	58,502	2,118,409	20	8	Dominated
Genetic risk-based screening at ages 2 and 6	2,104,594	54,155	2,158,750	26	7	Dominated

Source: Dr. Shweta Mital et al., *Diabetes Care* 2026

Sensitivity analyses showed that assay accuracy and test costs were the strongest drivers of variation in incremental cost-effectiveness ratios. For example, lowering assay specificity to 72% increased the ICER for general population screening at age four to $19,180 (~$14,300 USD), from $11,383.

Cost-effectiveness of population-wide screening is comparable to other pediatric screening programs

Despite higher costs, the authors note that these ICERs remain comparable to other pediatric screening programs, reinforcing that the central policy question is how much value health systems place on early detection and DKA prevention.

Global T1D screening efforts continue across the UK, Italy, and Israel

Given that over 85% of children who develop T1D do not have family history with the disease, global screening efforts for early T1D detection have been accelerating. Pilot programs in several countries demonstrated that large-scale programs are both feasible and clinically meaningful.

- In the UK, the ELSA study (n=24,875) screened children ages 2-17 and identified 160 children with stage 1 T1D and seven with undiagnosed stage 3 diabetes. This cohort also exhibited strong family engagement and high uptake of at-home testing. Follow-up study ELSA 2 will expand to 30,000 children and introduce NHS early-stage T1D clinics.
- Italy has already legislated nationwide screening for children ages 1-17, supported by the DiCE SCREEN pilot study, which achieved 93% uptake and identified both single- and multiple-antibody cases.
- Across Europe, the EDENT1F1 initiative has screened more than 80,000 children toward a goal of 200,000, while Israel's ADIR project is scaling ADAP-based screening, with early results showing meaningful detection rates.

Together, these programs reflect a growing international shift toward early identification, reduced DKA at diagnosis (often called a "soft landing"), and proactive, planned care rather than responding retroactively upon emergency.

Appendix: Previous coverage on population-wide T1D screening on CCKB

If you were interested in this study, you might also be interested in reading our other coverage on population-wide screening efforts globally:

1. The Lancet publishes preliminary results from the ELSA study investigating the feasibility of population-wide T1D screening in the UK
2. An early look into the Breakthrough T1D-led early-stage T1D screening consensus document: Recommendations on who, what, when, where, how

3. ELSA study shows acceptability and feasibility of general population screening for pre-symptomatic T1D among children in the UK
4. Discussion with Dr. Alice Cheng, Prof. Francesco Giorgino, and Prof. Ezio Bonifacio on population-wide, age-indiscriminate screening for T1D
5. T1D population screening: Insights from Breakthrough T1D, ADIR (Israel), D1CE (Italy), and EDENT1FI (Europe)

Close Concerns' Questions

1. What are the implications of general population screening preventing twice as many DKA cases as family-history strategies for emergency care utilization and long-term health system costs?
2. What operational or equity considerations arise when the most cost-effective strategy (general population screening at age four) still requires substantially higher upfront investment than targeted approaches?
3. Given that genetic-risk strategies cost over $2 million yet detect fewer cases than general population screening, what realistic role, if any, should genetic testing play in national screening programs?

-- by Kayla Mathieu, Kat Moon, Monica Oxenreiter, and Kelly Close

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[1] A decision tree to map early, one-time choices, followed by a Markov model to track how people move through health states over time.

[2]Note all monetary conversions reflect 2024 Canadian dollars, with USD values shown as approximate equivalents using a typical 2024 exchange rate of about 1 CAD ≈ 0.74-0.75 USD.