Screening for Type 2 Diabetes Mellitus (T2DM): A Systematic Review of Economic Evaluations

EE263

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Highlight statements

- ☞ Our findings suggest (a) in settings without existing T2DM screening, opting for screening with risk score alone, or combining biomarker and risk score may represent good value for money, (b) in settings with an existing T2DM screening, policy makers may consider targeted screening (e.g., among obese people), expanding screening locations, and lowering diagnostic biomarker thresholds.
- ☞ While all 27 EEs described their study population, none reported every aspect of screening designs.
- ☞ Future EEs of T2DM screening should report all aspects of screening designs, to allow synthesis and assessment of the transferability of findings.

Background

- Three SREEs (Ref (1)-(3); see below) have been performed to examine the value for money of T2DM screening.
- However, none of three SREEs (a) systematically evaluated screening designs (biomarkers / risk score, intervals, location, target population, diagnostic methods, treatment), (b) rated the methodological quality of the EEs.

Objectives

To review and to summarize

- The findings from recent economic evaluations of T2DM screening.
- Their methodological quality.

Methods

- We systematically searched three concepts (economic evaluations (EEs), T2DM, screening) in three databases (Medline, Embase, and EconLit) for EEs published between 2010 and 2023.
- Two independent reviewers screened for and rated their methodological quality (using CHEC-Extended).

Inclusion	Exclusion
• Cost-benefit, cost-effectiveness, cost-utility or cost-minimization analysis. • The intervention must be T2DM screening of any design. • Any comparator (no screening, or screening of a different design). • Any study design, any language.	• Gestational diabetes. • Diabetes in pediatric populations.

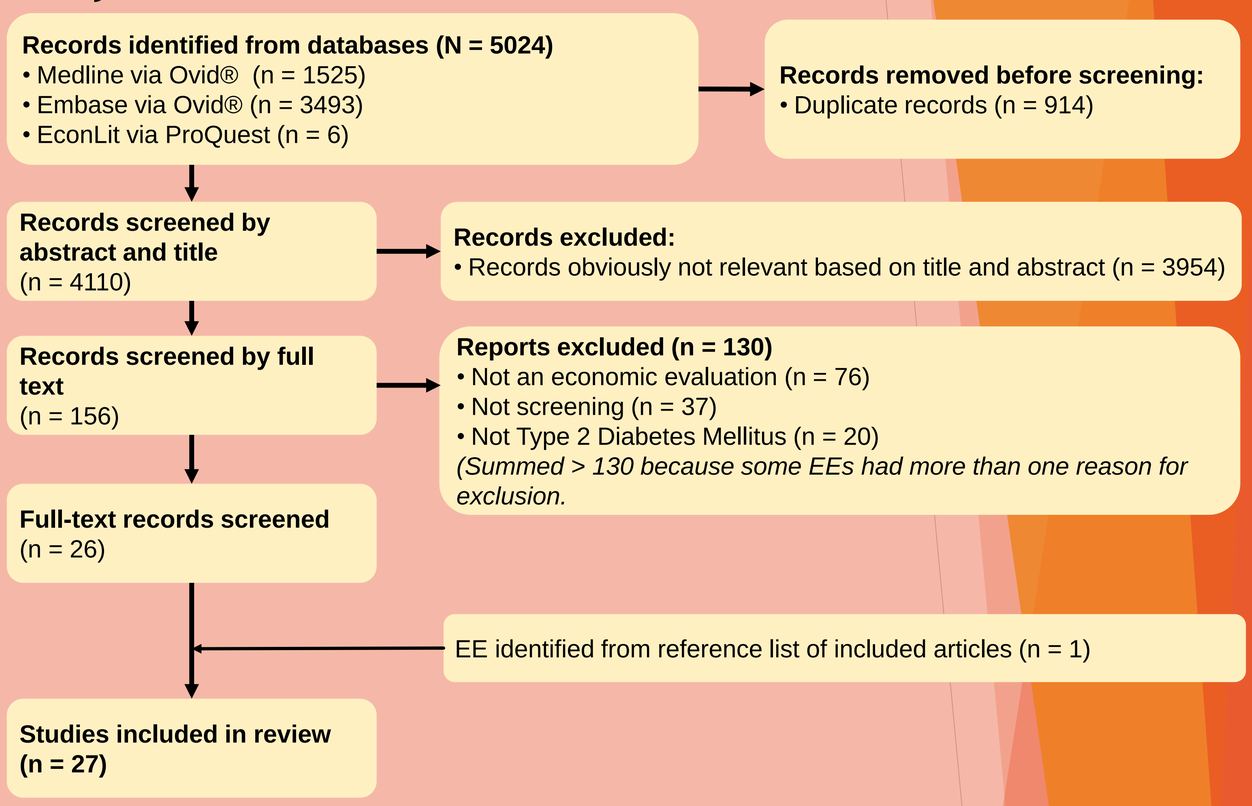
Results

- Of 27 EEs, majority were from high-income countries (70%).
- Most used single biomarkers (52%) to screen adults ≥30-<60 years old (59%) but did not report screening intervals (59%), locations (78%), diagnostic methods (70%) or treatments for those diagnosed (63%).
- Compared to no screening, T2DM screening using single biomarkers was found not cost-effective (23/51 comparisons), cost-effective (15/51) or inconclusive (13/51).
- Compared to no screening, single biomarkers in combination with a risk score was found dominant (21/40) or cost-effective (19/40) and risk score alone was mostly dominant (6/10).
- Compared to universal screening, targeted screening among obese, overweight, or older people may be cost-effective or dominant.
- Compared to fasting plasma glucose (FPG) or fasting capillary glucose, screening using risk scores was found mostly dominant or cost-effective. Expanding screening location or lowering HbA1c or FPG thresholds was found dominant or cost-effective.
- Each EE had 4-17 items (median 14/20 items) on CHEC-Extended rated "Yes / Rather Yes".

Limitations

- We examined only recent economic evaluations published within 2010 and 2023.

Study selection flow chart

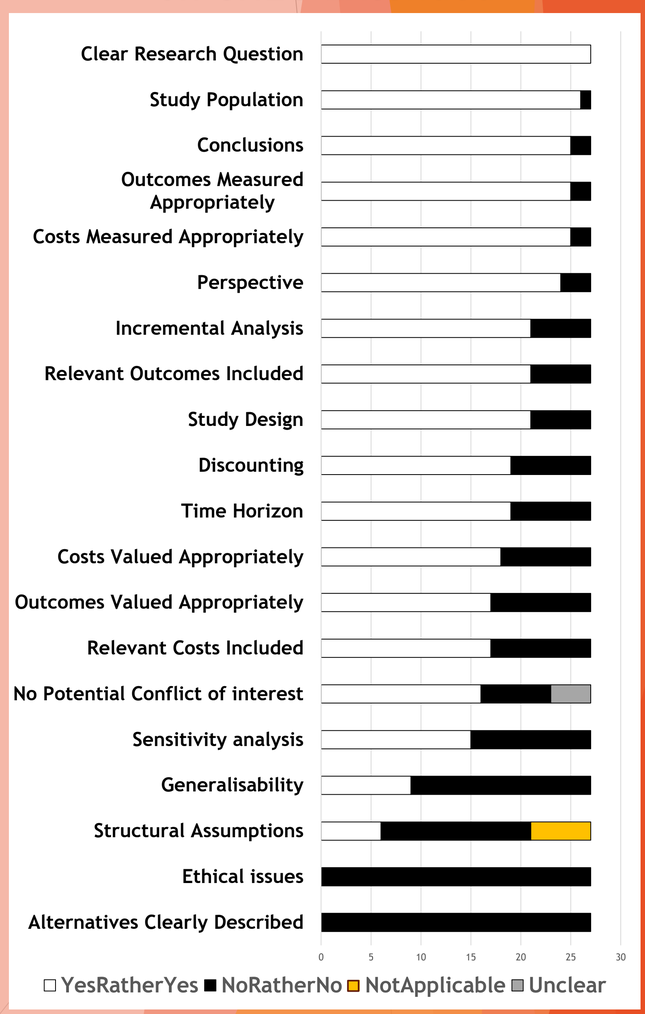


Screening designs examined by the 27 included EEs

Screening Interventions	n*	%
Screening Tools		
Single Biomarker	14	52%
Multiple Biomarkers	3	11%
Risk scores	7	26%
Single Biomarker + Risk score	3	11%
Screening Interval		
Not stated	16	59%
Every 3 years	8	30%
Every 1 year	7	26%
Every 5 years	6	22%
One-off	3	11%
Every 2 years	2	7%
> Every 5 years	2	7%
Every 4 years	1	4%
Screening Location		
Not stated	21	78%
Community	3	11%
Primary healthcare centre	3	11%
Hospital	1	4%
Minimum Age Eligible for Screening		
≥30-<60 years old	16	59%
≥16-<30 years old	5	19%
Not stated	6	22%
Diagnostic methods		
Not stated	18	67%
FPG	5	15%
Multiple blood glucose test combinations	3	11%
HbA1c	1	4%
Treatment for Those Diagnosed T2DM		
Not stated	17	63%
Lifestyle intervention with metformin	5	19%
Lifestyle intervention only	3	11%
Metformin only	1	4%
Others	1	4%

** Sums more than 27 because an economic evaluation may examine more than one screening design.*

Methodological quality rating, based on CHEC-Extended



Discussions and Conclusion

- The EEs did not report screening designs that were not part of the objectives. For example, most EEs (21/27) did not report screening locations, presumably because screening locations did not vary between the intervention and the comparator arms.
- Full reporting of screening designs in future EEs would allow synthesis of more meaningful conclusions and allow assessment of the transferability of findings to different settings.

References: (**1**) Najafi et al., Med J Islam Republic Iran 2016; 30:326 (**2**) Einarson et al., Current Medical Research & Opinion, 2017; 33(2): 331-358. (**3**) Waugh et al Health Technology Assessment 2007

Abbreviations: EE, economic evaluation; **SR**, systematic reviews; **SREE**, systematic review of economic evaluations.