

Digital Diabetes Screening in Switzerland: A cost-effectiveness analysis

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Background: Early identification of individuals at risk for type 2 diabetes (T2D) is critical for timely lifestyle intervention and prevention. While digital health applications offer a scalable and accessible approach to risk screening, their value depends on achieving sufficient accuracy to justify widespread use. This study aims to assess the cost-effectiveness of digital diabetes screening in Switzerland.

Methods: A decision-analytic model was developed comprising a 1-year budget impact component and a 5-year cost-effectiveness analysis, consistent with established economic evaluation frameworks for diabetes screening. The target population consisted of 7 million Swiss adults aged 20 and above, with a 6% prevalence of T2D, of which 33% were assumed to be undiagnosed. The risk score was modeled as a two-step screening process, with assumed sensitivities ranging from 60% to 95% and specificities ranging from 90% to 99%, followed by confirmatory laboratory testing (e.g., HbA1c, FPG). Uptake scenarios ranged from 20% to 80%. Screening costs were considered based on available market prices, ranging from CHF 5 to CHF 120 per user, confirmatory testing at CHF 40, and initial treatment at CHF 200. Outcomes included new cases of T2D detected and quality-adjusted life years (QALYs) gained. Early detection was assumed to reduce the incidence of diabetes-related complications by 15% over 5 years. All parameters were sourced from published literature and Swiss public health data.

Results: In the base-case scenario (50% uptake, CHF 5 screening cost), the program identified 55,440 new T2D cases, with a 1-year net cost of CHF 38 million, equating to CHF 680 per case for statutory insurers (LaMal). Outpatient providers experienced a predominantly positive or neutral financial impact, benefiting from a larger diabetic population that allowed for earlier disease management. Over five years, the screening cost CHF 528.5 million and generated 528,917 QALYs, compared to CHF 657.2 million and 522,000 QALYs without screening. The incremental cost-effectiveness ratio (ICER) was –CHF 18,565 per QALY gained, indicating that the screening was dominant (lower cost, higher benefit). Sensitivity analysis showed cost-effectiveness was maintained when specificity exceeded 90% and uptake surpassed 30%. These thresholds mark critical conditions under which the screening remains economically viable.

Conclusion: Our analysis indicates that integrating digital diabetes screening into outpatient care in Switzerland is economically dominant under realistic assumptions. This approach offers substantial potential for cost-effective early detection and significant system-level savings, making it a valuable addition to national preventive health strategies.