Evaluating a population-based screening programme for early detection of liver fibrosis and cirrhosis in primary care in Germany: a cost assessment study

Info

PUBLISHED DATE
2025-09-01

JOURNAL
BMJ Open

LINK
https://doi.org/10.1136/bmjopen-2024-090442

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Abstract

Objectives: Structured Early detection of Asymptomatic Liver fibrosis and cirrhosis (SEAL) is a population-based screening programme using non-invasive tests for the early detection of liver fibrosis. This study evaluates the cost implications if the SEAL programme were to be implemented in routine care in Germany.

Design: This study models cost differences with and without the SEAL screening programme. We regress costs of care on patient characteristics (age, comorbidities, sex, liver diseases, liver cancer and liver fibrosis and cirrhosis (LCI) stage) using statutory health insurance (SHI) data from routine care patients with LCI (n=4177). Based on these results, we predict per-patient costs for the patients newly diagnosed with LCI by SEAL (n=45). Costs with and without screening are estimated using patient age and LCI stage distributions from either SEAL or routine care.

Setting: SEAL was conducted in two German states. Initial screening was performed by patients' primary care physicians.

Participants: Individuals insured by SHI without a prior diagnosis of LCI, eligible for Check-up 35, a general health check-up programme primarily targeting adults aged 35 and older, conducted by primary care physicians.

Interventions: Screening via aspartate aminotransferase to platelet ratio index in primary care, for further evaluation serological diagnostics and ultrasound examinations in secondary care and specific assessment for definite diagnosis including transient elastography and liver biopsy for selected cases in tertiary care.

Primary and secondary outcome measures: Primary outcome measures: expected 5-year cost changes for SEAL patients diagnosed with fibrosis or cirrhosis compared to costs without a screening programme. Secondary outcome measures: case mix of leading chronic liver disease and LCI stages among patients diagnosed with advanced fibrosis or cirrhosis in SEAL versus routine care without screening.

Results: Screening leads to fewer decompensated cases at initial diagnosis (4.6% in SEAL vs 22.8% in routine care) and thus savings in the costs of care within the first years of diagnosis: total expected costs per case were €2175 lower (bias-corrected bootstrap CIs (BCI): €527 to 3734), and LCI-associated costs were reduced by €1218 (BCI: €296 to 2164). Comparing the savings to the additional costs of diagnosis (range: €1575–1726 per detected LCI case) reveals that average changes in costs with screening range from moderate savings to moderate extra costs.

Conclusions: SEAL liver screening identifies patients in less advanced stages of LCI. If only costs were considered that are directly attributable to LCI, savings within 5 years are unlikely to fully outweigh the costs of screening. However, since this approach might miss additional LCI-related costs, SEAL appears to be cost-neutral compared with routine care when considering total healthcare costs.

Registration number: The SEAL registration number is DRKS00013460. This study relates to its results.