

Estimating the health impact and cost-effectiveness of emergency department (ED) blood-borne virus (BBV) opt-out testing (OOT) for Germany – ED BBV OOT

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PURPOSE

- ❖ In 2023, an estimated 8,200 people were living with undiagnosed HIV in Germany. Late diagnosis (CD4<350) was 52% and 33% of individuals with HIV are diagnosed with advanced disease¹.
- ❖ For hepatitis, 85% of HBV and 65% of HCV infections remain undiagnosed².
- ❖ ECDC guidance advocates for integrated testing of BBVs³; however, there are no real-world studies in Germany evaluating this approach in practice.
- ❖ EDs are often the primary healthcare access point for vulnerable populations. Recent European real-world and modelling studies have demonstrated effectiveness and suggest cost-effectiveness of ED BBV OOT in high-prevalence areas⁴⁻⁷.
- **Aim:** We developed a theoretical health economic model to simulate the short and long-term impact of ED BBV OOT compared to current testing in ED as standard of care (SoC) in Germany.

METHODS

Model	Perspective
- Simulated short-term outcomes were assessed through a <i>decision tree</i>, based on published care models - Projected long-term outcomes were assessed through a <i>Markov model</i>, for HIV based on Monforte et al., 2025⁷; HBV and HCV were added de novo	National Health Service perspective over a lifetime
Outcomes	
	- Number of new diagnoses - Number linked to care - Quality-adjusted life years (QALYs) (discounted at 1.5% per annum) - Costs (discounted at 3% per annum)

Key assumptions:

- Current ED testing rate (SoC): 0%⁸; Opt-out programme uptake rate: 89%⁹.
- Other key model inputs and assumptions are provided in Table 1.

Table 1	Key data inputs [†]		
	HIV	HBV	HCV
Prevalence (in high-prevalence cities*)	0.35% ¹⁰	0.40% ¹¹	0.80% ¹²
Percentage of diagnoses that are new diagnoses	35% ⁹	85% ²	65% ²
LTC rate	63% ¹³	63% ¹³	33% ⁶

*Berlin, Frankfurt/Main, Cologne, Hamburg, Munich, Stuttgart [†]HIV confirmatory/HBsAg/HCV RNA

DEFINITION OF OPT-OUT TESTING (ECDC)

Opt-out testing is a “testing modality where patients are **informed** they will be tested as part of routine care but **may decline testing by raising an objection to the test**”³.

LAY SUMMARY

Opt-out testing (OOT) for blood-borne viruses (BBVs, which include HIV, HBV, and HCV) in German emergency departments (ED) in high-prevalence areas could substantially improve early diagnosis and linkage to care. Our health economic model comparing ED BBV OOT to current practice (no systematic testing) showed that for every 10,000 patients tested, 82 new BBV cases would be identified and 39 linked to care. The strategy was highly cost-effective, with a weighted average of 5,762€ per QALY gained—well below Germany’s threshold of 42,634€—and remained robust even under conservative assumptions. Combined ED BBV testing offered greater health and economic benefits than HIV-only testing, supporting its potential for consideration in innovative testing strategies.

RESULTS

Figure 1: Short-term results

For **10,000** people having ED blood tests, compared to SoC, opt-out testing resulted in **82** new diagnoses and **39** new LTC.

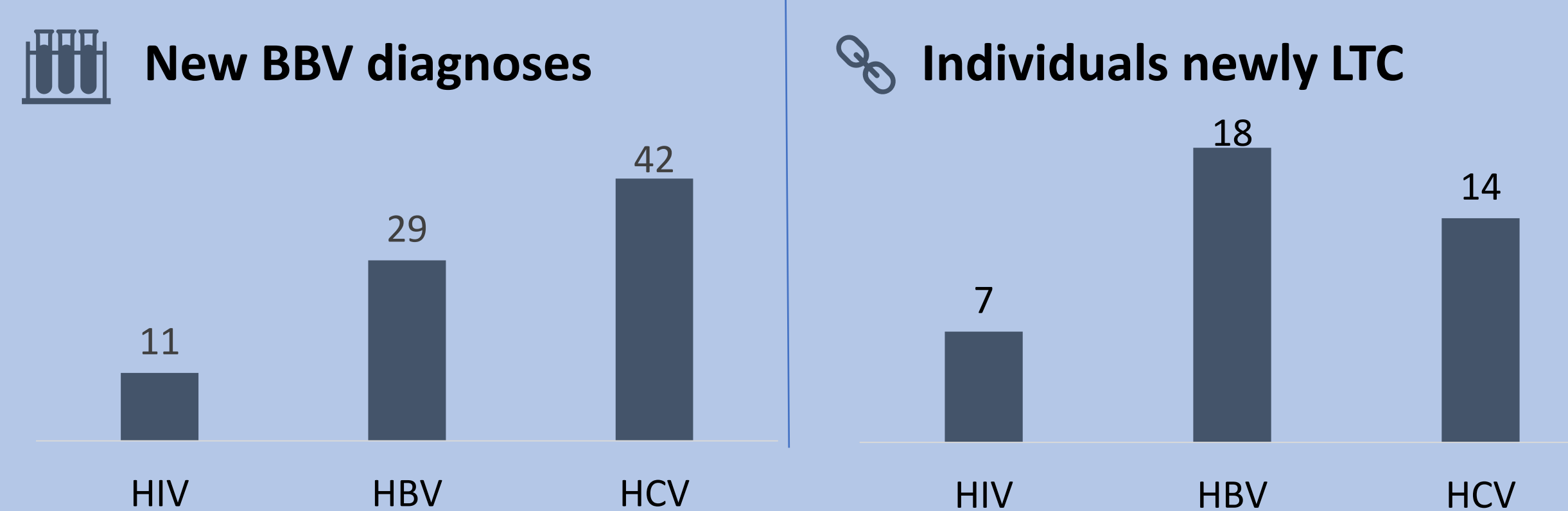
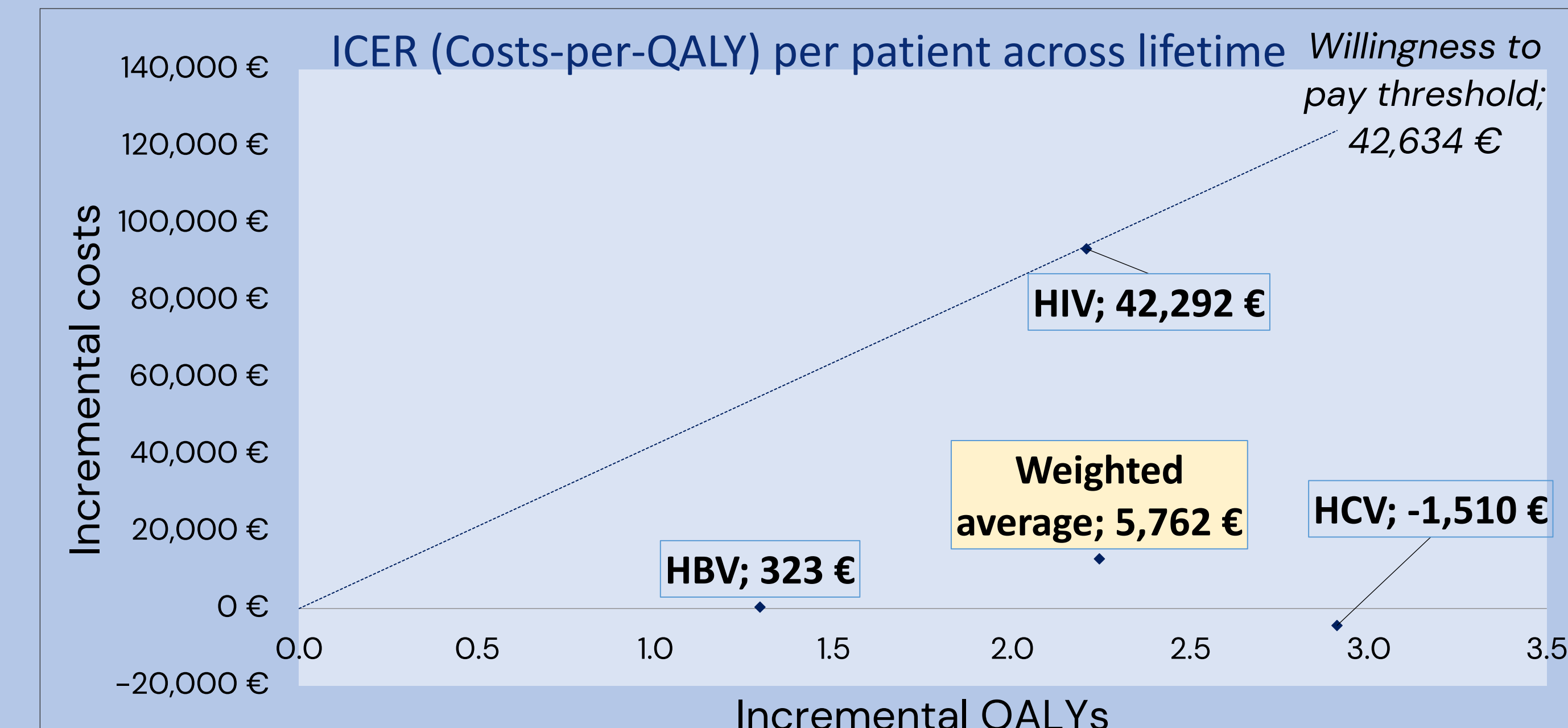


Figure 2: Long-term results



- The short-term results (Figure 1) indicate **ED opt-out testing is effective in identifying BBV cases and improving LTC**, compared to SoC, across BBVs.
- The long-term results (Figure 2) show ED opt-out testing is estimated to be **highly cost-effective**: At a combined BBV prevalence of 1.5%, the opt-out testing strategy costs 5,762€/QALY, with individual cost-effectiveness varying by BBV type. The accepted cost per QALY in Germany is 42,634€¹⁴.
- Since HCV prevalence has a strong impact on overall BBV results, a sensitivity analysis was conducted to test the impact of lower HCV prevalence. The weighted average ICER across all BBVs **remained cost-effective** (15,966€/QALY) even at an HCV prevalence of only 0.1%.

CONCLUSIONS

- Our findings indicate that **ED BBV OOT could improve health outcomes** and be **highly cost-effective** in high-prevalence areas in Germany.
- **Combined BBV testing** offers **greater health benefits** and substantially **improved value for money**, compared to **HIV testing alone**.
- Our model may **underestimate** the **true benefits** and **cost avoided**, as we did not consider **transmissions averted (U=U)** or **societal benefits**.
- We encourage **dialogue** on innovative testing strategies to reduce late diagnosis and **real-world studies** to validate our findings.

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REFERENCES: References can be accessed by scanning the QR code.

