Cost–Utility Analysis of Inclisiran Added to Standard of Care for Secondary Prevention of Cardiovascular Disease in Egypt: A Public Payer Perspective

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Markov Cost–Utility Model | Lifetime Horizon (35 years)

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At its current list price, inclisiran is not cost-effective in Egypt — the price would need to fall by >95%.

KEY FINDING **ICER 10,372,055 EGP/QALY** • +0.134 QALYs • +1,392,471 EGP • P(cost-effective) = 0% at 150,000–450,000 EGP/QALY

OBJECTIVE & RESEARCH QUESTION

- Inclisiran (siRNA, twice-yearly) lowers LDL-C by ~50%, yet its economic value in Egypt is unquantified.
- **Decision problem:** should the Egyptian public payer reimburse inclisiran for secondary prevention of ASCVD — and at what price?
- **Evidence gap: no prior evaluation has combined Egyptian prices, public-hospital costs and a nationally relevant cost-effectiveness threshold.**

METHODS AT A GLANCE

PERSPECTIVE Egyptian public payer; direct medical costs only
POPULATION Established ASCVD, secondary prevention; entry age 65 y
INTERVENTION Inclisiran 284 mg + SC (baseline, month 3, then 6-monthly)
COMPARATOR SC alone — atorvastatin 40 mg + ezetimibe 10 mg daily
MODEL 5-state Markov cohort; 1-year cycle; half-cycle correction
TIME HORIZON Lifetime — 35 years (to age 100)
DISCOUNTING 3.5% per year, costs and outcomes
OUTCOME QALYs; ICER expressed as EGP per QALY gained
EFFICACY Pooled ORION-10/11 LDL-C reduction via CTT log-linear relationship
COSTS Local Egyptian market prices and public hospital tariffs, 2024 EGP
UNCERTAINTY One-way DSA (±20%); PSA 10,000 Monte Carlo iterations
SCENARIOS 14 structural scenarios (horizon, risk, persistence, effect size, utilities)
SOFTWARE Model in Microsoft Excel; DSA and PSA in R
WTP THRESHOLD 150,000–450,000 EGP/QALY (1–3× GDP per capita)

MODEL STRUCTURE

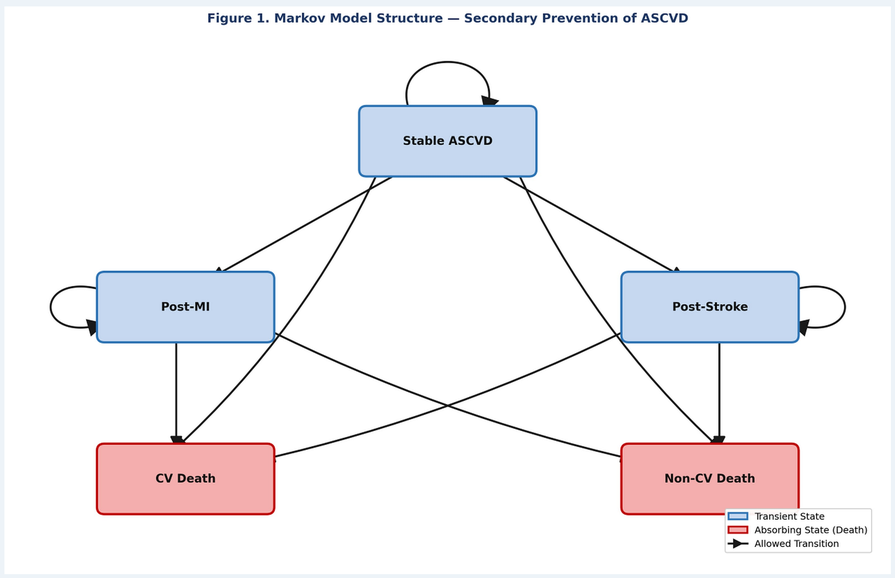


Figure 1. Five-state Markov cohort model. All patients enter in the Stable ASCVD state and, in each 1-year cycle, may remain event-free, experience a non-fatal myocardial infarction or a non-fatal ischaemic stroke, or die from cardiovascular or non-cardiovascular causes. Patients in Post-MI and Post-Stroke remain at risk of recurrent events; both death states are absorbing. A half-cycle correction was applied over a 35-year lifetime horizon from cohort entry at age 65.

BASE-CASE RESULTS (per patient, discounted)

8.82	8.96	+0.134
QALYs — SC alone	QALYs — Inclisiran + SC	Incremental QALYs

BASE-CASE ICER

10,372,055 EGP per QALY gained

≈ 69× above 1× GDP (150,000) and 23× above 3× GDP (450,000) per QALY

Total cost: 119,235 EGP (SC) vs 1,511,706 EGP (inclisiran + SC)
Events avoided / 1,000 patients: 31.7 MI · 26.7 strokes Life-years: +0.21 undiscounted

QALY totals rounded; incremental values calculated from unrounded results.

PROBABILISTIC SENSITIVITY ANALYSIS

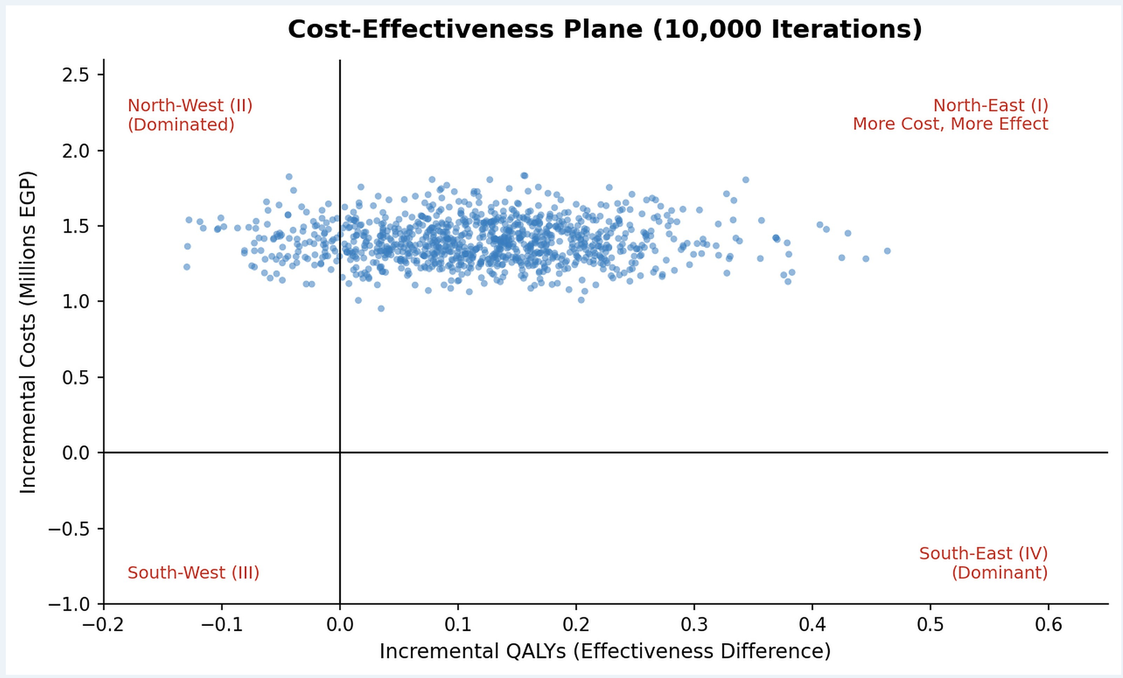


Figure 2. Cost-effectiveness plane, 10,000 PSA iterations. Approximately 90% of iterations fell in the north-east quadrant — greater benefit at substantially higher cost — and approximately 10% in the north-west quadrant, indicating higher cost with marginally lower benefit. No iteration fell in either southern quadrant, so inclisiran was never cost-saving. Across the locally relevant willingness-to-pay range (150,000–450,000 EGP per QALY), none of the 10,000 iterations was cost-effective.

DETERMINISTIC SENSITIVITY ANALYSIS

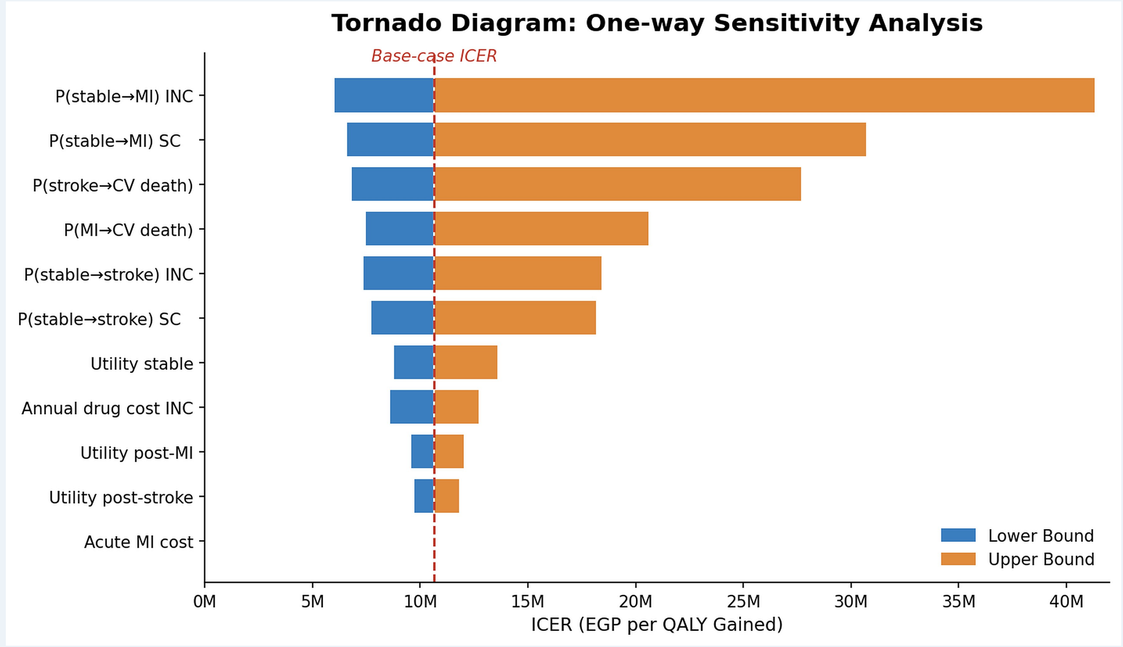


Figure 3. Tornado diagram, one-way DSA (±20%). CV event transition probabilities produced the widest ICER variation (~6.0 to >40 million EGP per QALY), followed by inclisiran acquisition cost (8.6–12.7 million) and the Stable ASCVD utility weight. Across every parameter tested, the ICER remained far above the Egyptian WTP range.

PRICE THRESHOLD ANALYSIS

58,500	~850	~2,500
EGP per dose (current list price)	EGP per dose to reach 1× GDP	EGP per dose to reach 3× GDP

>98% price reduction → 1× GDP (150,000 EGP/QALY)
>95% price reduction → 3× GDP (450,000 EGP/QALY)
All prices in 2024 EGP; ICER exceeds the WTP range by 23–69×.

CONCLUSIONS & POLICY IMPLICATIONS

- **Not cost-effective at list price:** ICER 10,372,055 EGP/QALY — 23–69× the 150,000–450,000 EGP/QALY threshold; 0% probability of cost-effectiveness.
- **Conclusion is robust:** DSA range 6.0 to >40 million and 14 structural scenarios 7.6–27.7 million EGP/QALY — none approaches the threshold.
- **Price is the main lever:** >98% cut (~850 EGP/dose) to reach 1× GDP; >95% (~2,500 EGP/dose) to reach 3× GDP per QALY.
- **Internationally consistent:** NICE (2021), CADTH (2022, 2024) and China (Zhou 2024, >88% cut required) all found list-price ICERs above conventional thresholds.
- **Policy implication:** reimburse only via value-based price–volume negotiation or conditional listing in a high-priority subgroup, after a formal budget-impact analysis — cost-effectiveness is not affordability.

CONNECT ON LINKEDIN

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