**IVPE Cost-Savings Calculator – Wireframe Spec**

Here’s a clean, builder-ready spec your developer can use to ship a simple **IVPE Cost-Savings widget**. It matches your request, keeps the UX tight, and maps to the background spreadsheet you’ll email (**“IVPE Economic Model\_Single Arm vs RCT\_Pembro dose de-escalation\_.xlsx”**).

**1) What this widget does**

For a chosen drug (e.g., pembrolizumab), it lets a self-insured employer:

* enter today’s cost and a lower-cost alternative (or lower dose),
* size their current patient pool,
* set trial enrollment, pricing, and success odds,
* see savings during the study and after success when more patients move to the lower-cost option,
* view ROI/savings multiples and export a one-pager.

**2) UI layout (single screen)**

**Left column: Inputs**  
**Right column: Results**

**Inputs (top to bottom)**

1. **Currency and time basis**
   * Currency: $
   * Cost basis: per patient **per year** or per month)
2. **Drug costs**
   * Expensive drug cost (per pt/yr or pm): number
   * Lower-cost option (per pt/yr or pm): number  
     • “Enter lower-cost price”   
     • If dose reduction is used, compute lower-cost = expensive × (1 − dose%).
3. **Population**
   * Patients currently on expensive drug: integer
4. **Trial pricing and enrollment**
   * **Per-enrollee price to payer (as % of expensive drug cost)**: slider 70–95%  
     Helper text: “Payer pays this % during the study for enrolled members. Payer saves the remainder.”  
     Inline calc: show “Payer saving per enrollee during study = (100 − %)% of current drug cost.”
   * **Enrollment rate** (share of current patients who enroll): slider 1–10%
5. **Outcomes and adoption**
   * **Probability of trial success**: slider 70–99%
   * **Post-trial adoption** (share of all current patients moved to lower-cost option if success): slider 40–90%
6. **Timing and finance (advanced, collapsible)**
   * Trial duration: months slider 6–12 (default 10)
   * Post-trial horizon: years slider 1–5 (default 3)
   * Discount rate for NPV: 0–10% (default 3%)
   * Optional program fee to payer (one-time): number (default 0)

**Results (cards and a small chart)**

* **In-Study Savings (during trial)**  
  shows total and per-enrollee
* **Expected Post-Trial Savings**  
  success-weighted over horizon
* **Total Savings** = in-study + expected post-trial
* **Savings Multiple / ROI**  
  If Program fee > 0, show ROI = Total savings ÷ Program fee.  
  Also show simple “in-study multiple” and “post-trial multiple” if helpful.
* **Key drivers** (mini list): enrollment %, % price during study, adoption %, success %.
* **Download PDF** button with inputs + results.

A single bar chart is enough: bars for In-Study, Expected Post-Trial, Total.

**3) Calculations (simple and transparent)**

Let:

* CexpC\_\text{exp}Cexp​ = expensive drug cost per pt/yr
* CaltC\_\text{alt}Calt​ = lower-cost option per pt/yr
* NNN = patients currently on expensive drug
* penrollp\_\text{enroll}penroll​ = enrollment rate (e.g., 0.05 for 5%)
* fff = per-enrollee **price %** during study (e.g., 0.80 for 80%)
* psuccp\_\text{succ}psucc​ = probability of trial success (e.g., 0.80)
* padoptp\_\text{adopt}padopt​ = post-trial adoption share (e.g., 0.60)
* mtrialm\_\text{trial}mtrial​ = trial months (e.g., 10)
* YYY = post-trial horizon in years (e.g., 3)

Derived:

* **Enrollees** E=N×penrollE = N \times p\_\text{enroll}E=N×penroll​
* **Per-enrollee in-study payer saving per year**  
  Sper,yr=(1−f)×CexpS\_{\text{per,yr}} = (1 - f)\times C\_\text{exp}Sper,yr​=(1−f)×Cexp​  
  Intuition: payer pays f×C\_exp instead of 1.0×C\_exp for enrollees during study
* **Per-enrollee in-study saving over the trial**  
  Sper,trial=Sper,yr×mtrial12S\_{\text{per,trial}} = S\_{\text{per,yr}} \times \frac{m\_\text{trial}}{12}Sper,trial​=Sper,yr​×12mtrial​​
* **In-Study Savings (total)**  
  Sin=E×Sper,trialS\_{\text{in}} = E \times S\_{\text{per,trial}}Sin​=E×Sper,trial​
* **Post-trial switchers** Nswitch=N×padoptN\_\text{switch} = N \times p\_\text{adopt}Nswitch​=N×padopt​
* **Annual saving per switcher**  
  ΔC=Cexp−Calt\Delta C = C\_\text{exp} - C\_\text{alt}ΔC=Cexp​−Calt​  
  If a dose-reduction toggle is used, set Calt=Cexp×(1−dose%)C\_\text{alt} = C\_\text{exp} \times (1 - \text{dose\%})Calt​=Cexp​×(1−dose%).
* **Expected Post-Trial Savings over horizon**  
  Spost=psucc×Nswitch×ΔC×YS\_{\text{post}} = p\_\text{succ} \times N\_\text{switch} \times \Delta C \times YSpost​=psucc​×Nswitch​×ΔC×Y  
  Keep it simple as a step change. If you later want a ramp, apply a ramp factor or adoption curve.
* **Total Savings**  
  Stot=Sin+SpostS\_{\text{tot}} = S\_{\text{in}} + S\_{\text{post}}Stot​=Sin​+Spost​
* **ROI / Savings multiple**  
  If Program fee to payer F>0F>0F>0:  
  ROItotal=StotF\text{ROI}\_\text{total} = \frac{S\_{\text{tot}}}{F}ROItotal​=FStot​​  
  ROIin=SinF\text{ROI}\_\text{in} = \frac{S\_{\text{in}}}{F}ROIin​=FSin​​  
  ROIpost=SpostF\text{ROI}\_\text{post} = \frac{S\_{\text{post}}}{F}ROIpost​=FSpost​​  
  If F=0F=0F=0, hide ROI and show “Savings” only.

Notes for the developer:

* Validate: if Calt≥CexpC\_\text{alt} \ge C\_\text{exp}Calt​≥Cexp​, flag “No savings from lower-cost option.”
* All inputs are editable. Show live tooltips with the formula behind each output.
* Keep units visible: “per patient per year”, “members”, “%”.

**4) Default values (so it works out of the box)**

* Cexp=100,000C\_\text{exp} = 100{,}000Cexp​=100,000 per pt/yr
* Calt=50,000C\_\text{alt} = 50{,}000Calt​=50,000 per pt/yr
* N=1,000N = 1{,}000N=1,000 patients
* f=0.80f = 0.80f=0.80 (slider 70–95%, default 80%)  
  Helper: “Payer saving per enrollee during study: 20% of current drug cost”
* penroll=0.05p\_\text{enroll} = 0.05penroll​=0.05 (1–10%, default 5%)
* psucc=0.80p\_\text{succ} = 0.80psucc​=0.80 (70–99%, default 80%)
* padopt=0.60p\_\text{adopt} = 0.60padopt​=0.60 (40–90%, default 60%)
* mtrial=10m\_\text{trial} = 10mtrial​=10 months
* Y=3Y = 3Y=3 years
* F=0F = 0F=0 by default

**5) Microcopy for clarity**

* Under the **price %** slider:  
  “During the study, payer pays this % of today’s drug cost for enrolled members. Savings during study = (100 − %) of today’s cost.”
* Under **post-trial adoption**:  
  “If the study succeeds, this % of all current patients move to the lower-cost option.”
* Under **probability of success**:  
  “Used only for expected post-trial savings.”

**6) State diagram (simple)**

Idle

└─► User sets inputs

└─► Validate (costs, ranges)

├─ if invalid → Show inline error, stay on Inputs

└─ if valid → Compute

└─► Render Results (cards + chart)

├─ Export PDF/CSV

└─ Adjust inputs → recompute (loop)

**7) PDF export (one-pager)**

* Header: Employer name (optional), date, scenario name
* Inputs summary: costs, N, sliders
* Results: In-Study Savings, Expected Post-Trial Savings, Total, ROI/multiples (if applicable)
* Mini chart and “what drives the result” bullets
* Footer: model version and your disclaimer

**8) Link to the background spreadsheet**

* Note in README: “Calculations align with **IVPE Economic Model\_Single Arm vs RCT\_Pembro dose de-escalation\_.xlsx**. This widget uses the simplified payer-view: in-study saving = (1 − price%) × current drug cost; post-trial saving = current − lower-cost. Enrollment and adoption are direct percents of the current patient pool.”

**Tiny worked example (sanity check)**

Inputs: Cexp=100kC\_\text{exp}=100kCexp​=100k, Calt=50kC\_\text{alt}=50kCalt​=50k, N=1,000N=1{,}000N=1,000, f=0.80f=0.80f=0.80, penroll=5%p\_\text{enroll}=5\%penroll​=5%, mtrial=10m\_\text{trial}=10mtrial​=10 months, psucc=80%p\_\text{succ}=80\%psucc​=80%, padopt=60%p\_\text{adopt}=60\%padopt​=60%, Y=3Y=3Y=3.

* Enrollees E=50E=50E=50
* In-study per-enrollee saving over 10 months =(1−0.80)×100k×10/12=16,667= (1-0.80)\times100k\times 10/12 = 16{,}667=(1−0.80)×100k×10/12=16,667
* In-study total Sin=50×16,667=833,350S\_{\text{in}} = 50 \times 16{,}667 = 833{,}350Sin​=50×16,667=833,350
* Post-trial switchers =1,000×0.60=600= 1{,}000 \times 0.60 = 600=1,000×0.60=600
* Annual delta =100k−50k=50k= 100k - 50k = 50k=100k−50k=50k
* Expected post-trial =0.80×600×50k×3=72,000,000= 0.80 \times 600 \times 50k \times 3 = 72{,}000{,}000=0.80×600×50k×3=72,000,000
* Total savings =72.83M= 72.83M=72.83M  
  If Program fee F=3MF = 3MF=3M, **ROI total ≈ 24.3×**, which fits your “1.2× during study, 20–100× after success” narrative.

A screenshot of a medical form

AI-generated content may be incorrect.