MODELLED CEILING — NOT A PERSONAL FORECAST

The headline figure on this page is an **upper bound** under best-case assumptions; a conservative **floor** (the lower confidence bound, or the same model run at a higher cross-correlation) is materially lower. Any individual's result is unknown and may fall anywhere in — or below — this range. This is a population model, not a prediction about you. Discuss with your physician before acting.

▶ What this number assumes

LONGEVITY RESEARCH · MIMIC-III MORTALITY HARNESS · **BUILD V3.63**

MIMIC-III → Early-Death Oracle Harness

Loads your uploaded MIMIC-III demo CSVs, assembles a per-admission record, routes each free-text admission diagnosis to the matching **early-death (mortality-endpoint) oracle**, computes the maximum achievable risk reduction and life-years saved, and compares against the patient's **observed** in-hospital outcome. Runs entirely in your browser.

⚠ Runs on the 100-patient MIMIC-III DEMO · processing is local (no upload/network) · representative oracle effect sizes

00 The modelled ceiling, in one number

> *"The fox knows many things, but the hedgehog knows one big thing."* — *Archilochus, fr. 201*

Run across **21,344** patient-records (NHANES, ambulatory) routed to the **6** early-death (mortality-endpoint) oracles, the harness projects a mean gain of **+8.5 life-years per person** from the Bayesian Pareto-optimum set relative to the disease-specific standard-of-care baseline (mean usual-care baseline 24.2 LY → mean Pareto-optimum 32.7 LY; **+181,626 life-years** across the cohort). The effect concentrates where modifiable *post-acute* hazard is largest — Pulmonary (+11.0), Heart Disease (+10.3), Metabolic Disease (+9.5) — and is smallest for Cancer (+5.6), whose mortality sits in an acute or age-driven phase no prevention bundle reaches. Every oracle's achievable-risk-reduction frontier is substantial (cross-correlation-corrected joint hazard reduction of 67.2%–83.7%, ρ=0.30); the translated life-years are the disciplined figure.

Discussion. Read as a study, this is a *transportability-and-ceiling* exercise, not a clinical estimate. The mean Δ is an **upper bound** on the incremental gain: the Pareto hazard ratio is applied multiplicatively to the usual-care hazard, so interventions already embedded in standard care (e.g. a statin) are credited a second time. The overlap-free version — the prescribed-vs-Pareto *headroom* in §06 — requires the `PRESCRIPTIONS` table; without it that split reads n/a. Three further bounds on interpretation: (i) the chronic-prevention hazard ratios are transported from ambulatory trials to post-ICU survivors; (ii) the acute first-year mortality m_1 and post-acute hazard h_long are representative literature values, not fit to this cohort; and (iii) where observed actual life-years are absent (a selected-decedent demo with the in-hospital-death flag suppressed), the baseline reflects the disease group's standard-of-care expectation, not the loaded sample. Stated precisely: under transported, literature-calibrated assumptions, the Pareto-optimum set recovers a *modeled* mean gain per person over standard of care — a hypothesis-generating ceiling to validate against cohort-fit baselines and an overlap-free prescribed-vs-Pareto comparison, not a prescribe-tomorrow figure. Not for clinical or policy use.

01 Load the data

Select the CSV files from your `archive.zip` (at minimum `PATIENTS.csv` and `ADMISSIONS.csv`; `structured_medical_records.csv` is optional and used only to read the stated Age). Files are parsed locally in your browser — nothing is uploaded.

> **NHANES mode (free, no-application data).** This harness also reads **NHANES** `.XPT` files directly (SAS-transport, parsed in-browser). Drop a demographics file (`DEMO_*.xpt`, with `SEQN` / `RIDAGEYR` / `RIAGENDR`), a prescriptions file (`RXQ_RX_*.xpt`, `RXDDRUG`), the medical-conditions questionnaire (`MCQ_*.xpt` / `DIQ` / `KIQ` for routing), and a linked-mortality file (`SEQN` + `MORTSTAT` + `PERMTH_EXM`); it auto-detects NHANES, routes by self-reported condition, and runs the same standard-of-care vs Pareto comparison on an **ambulatory** population (general-population survival baseline). You download the files from CDC and drop them here — the tool can't fetch `wwwn.cdc.gov` directly (cross-origin). **NHANES III fixed-width files** (e.g. `adult.dat`) also load: drop the data file together with its **SAS layout** (`adult.sas`) — the tool parses the `INPUT` column positions and `LABEL`s, then routes by condition label. (Bring one fixed-width file + its `.sas` per load; prescriptions/mortality can come from `.XPT` or CSV. Continuous cycles (1999+) are all-`.XPT` and need no layout.)

> **Harmonized NHANES 1988–2018 (figshare/Kaggle, Nguyen *et al.*) — drop the raw modules directly.** Download the *cleaned* **demographics**, **questionnaire** (or **response**), **mortality** and **medications** module CSVs and drop all of them here at once. The tool now **streams** each file and keeps only the handful of columns it needs (`SEQN`, age, sex, self-reported conditions, `MORTSTAT`/`PERMTH`, drug names), so the 1000+-column questionnaire file loads without overwhelming the browser; it then merges them on `SEQN` and runs the analysis. If the medications module stores drug *codes*, also drop `dictionary_drug_codes.csv`. No Python, no fetching — still fully local. Drop the **response** module too and the harness computes a clinical **stage** from the labs (kidney/liver/metabolic/pulmonary) for §04b; otherwise stage shows `NA-stage`. If a file's columns aren't recognised, the load status lists exactly what each file was read as, so a name mismatch is visible rather than silent.

> **What this archive does and does not contain.** It has demographics (PATIENTS), admissions with a free-text `diagnosis` and death flags (ADMISSIONS), labs, and free-text reports. It does **not** contain `PRESCRIPTIONS`, `DIAGNOSES_ICD`, or `PROCEDURES_ICD`. Consequences: routing uses the free-text admission diagnosis (not ICD codes), and the **doctor-prescribed-protocol risk reduction cannot be computed** (no medication table). The harness therefore reports the oracle's **maximum achievable** risk reduction and life-years, plus the patient's **observed** outcome.

02 Early-death oracles included

Every atlas oracle whose primary endpoint is mortality / early death is included here. Population-count analyses (us-mortality, self-caused-harm, rare-disease) are excluded. Symptom-scale and biomarker endpoints (osteoarthritis, depression, anxiety, ADHD, schizophrenia, PTSD, OCD, bipolar, LDL cholesterol) have no patient-level early-death endpoint and are handled separately in **§08** as non-mortality reductions, not life-years.

ORACLE	ENDPOINT	INTERVENTIONS	ROUTED FROM DIAGNOSES CONTAINING…
All-Cause Mortality	All-cause mortality	7	sepsis, infection, UTI, trauma, GI bleed, syncope, fever, failure-to-thrive (default)
Cancer (cause-specific mortality)	Cause-specific 5-yr mortality	6	cancer, carcinoma, malignant, tumour, neoplasm, metastatic, sarcoma, leukemia, glioma
Lymphoma / Waldenström	All-cause mortality in WM	4	lymphoma, waldenström, myeloma
Heart Disease (CVD)	MACE / all-cause mortality	7	heart, cardiac, CHF, congestive, STEMI, NSTEMI, angina, myocardial, coronary, VF arrest, arrhythmia
Kidney Disease (CKD)	ESRD / renal-composite / mortality	6	renal, kidney, ESRD, nephropathy, hyperkalemia, dialysis
Liver Disease	Decompensation / HCC / mortality	6	liver, hepatitis, cirrhosis, varices, hepatic, ESLD, ascites
Pulmonary (COPD/IPF/PAH)	5-yr all-cause mortality	6	pneumonia, COPD, asthma, respiratory, shortness of breath, IPF, pulmonary, bronchitis, dyspnea, tracheal
Metabolic Disease (T2D)	HbA1c / MACE / all-cause mortality	6	diabetes, DKA, hyperglycemia, ketoacidosis, metabolic
Solid-Organ Transplant	5-yr post-transplant all-cause mortality	6	transplant
Brain (tumour / stroke)	All-cause mortality at 24 months	6	stroke, TIA, intracranial, subdural, hemorrhage, seizure, brain, encephalopathy, cranial

03 Per-admission output

SUBJECT/ADM	AGE/SEX	ADMISSION DIAGNOSIS	ORACLE	PRESCRIBED RR	MAX ACHIEVABLE RR	USUAL-CARE BASELINE LY	PARETO-OPTIMUM LY	ACTUAL LY (OBS.)	Δ YEARS ADDED	OBSERVED
2/2	77/M	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	6.98	8.70	14.75	+1.72	deceased (NDI)
11/11	15/M	Metabolic Disease (T2D)	Metabolic Disease (T2D)	0.0%	67.2%	61.65	73.84	17.17	+12.19	deceased (NDI)
12/12	37/F	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	0.0%	71.4%	45.06	56.34	n/a	+11.28	alive at follow-up
13/13	70/M	Metabolic Disease (T2D)	Metabolic Disease (T2D)	10.8%	67.2%	13.77	22.07	n/a	+8.31	alive at follow-up
24/24	53/F	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	18.97	26.63	13.42	+7.66	deceased (NDI)
29/29	62/M	Brain (tumour / stroke)	Brain (tumour / stroke)	0.0%	75.5%	12.71	17.56	2.25	+4.86	deceased (NDI)
33/33	46/F	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	0.0%	71.4%	36.54	47.51	n/a	+10.98	alive at follow-up
40/40	68/F	Metabolic Disease (T2D)	Metabolic Disease (T2D)	0.0%	67.2%	17.39	25.69	n/a	+8.30	alive at follow-up
46/46	85/M	Brain (tumour / stroke)	Brain (tumour / stroke)	14.5%	75.5%	4.51	5.35	n/a	+0.84	alive at follow-up
49/49	12/F	Metabolic Disease (T2D)	Metabolic Disease (T2D)	0.0%	67.2%	68.50	79.60	3.25	+11.10	deceased (NDI)
55/55	61/M	Metabolic Disease (T2D)	Metabolic Disease (T2D)	11.5%	67.2%	20.40	29.88	11.58	+9.48	deceased (NDI)
59/59	70/M	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	9.58	12.48	n/a	+2.90	alive at follow-up

SUBJECT/ADM	AGE/SEX	ADMISSION DIAGNOSIS	ORACLE	PRESCRIBED RR	MAX ACHIEVABLE RR	USUAL-CARE BASELINE LY	PARETO-OPTIMUM LY	ACTUAL LY (OBS.)	Δ YEARS ADDED	OBSERVED
63/63	0/F	Metabolic Disease (T2D)	Metabolic Disease (T2D)	0.0%	67.2%	79.52	91.23	21.25	+11.71	deceased (NDI)
67/67	13/M	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	8.6%	71.4%	63.44	77.13	4.17	+13.68	deceased (NDI)
71/71	69/F	Heart Disease (CVD)	Heart Disease (CVD)	12.2%	72.4%	16.62	26.04	n/a	+9.42	alive at follow-up
74/74	13/M	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	0.0%	71.4%	63.44	77.13	20.25	+13.68	deceased (NDI)
78/78	10/F	Metabolic Disease (T2D)	Metabolic Disease (T2D)	0.0%	67.2%	70.35	81.54	13.83	+11.19	deceased (NDI)
80/80	75/M	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	22.1%	74.1%	7.69	9.71	n/a	+2.02	alive at follow-up
83/83	60/F	Metabolic Disease (T2D)	Metabolic Disease (T2D)	10.8%	67.2%	23.95	33.01	n/a	+9.07	alive at follow-up
86/86	63/F	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	14.02	19.12	4.50	+5.10	deceased (NDI)
90/90	61/M	Heart Disease (CVD)	Heart Disease (CVD)	16.7%	72.4%	20.40	31.35	n/a	+10.95	alive at follow-up
94/94	61/M	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	22.1%	74.1%	13.43	18.24	n/a	+4.81	alive at follow-up
95/95	45/M	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	0.0%	71.4%	34.17	46.11	n/a	+11.94	alive at follow-up
96/96	43/M	Brain (tumour / stroke)	Brain (tumour / stroke)	14.5%	75.5%	21.78	31.74	3.25	+9.96	deceased (NDI)
108/108	22/F	Brain (tumour / stroke)	Brain (tumour / stroke)	0.0%	75.5%	34.52	51.77	n/a	+17.25	alive at follow-up

SUBJECT/ADM	AGE/SEX	ADMISSION DIAGNOSIS	ORACLE	PRESCRIBED RR	MAX ACHIEVABLE RR	USUAL-CARE BASELINE LY	PARETO-OPTIMUM LY	ACTUAL LY (OBS.)	Δ YEARS ADDED	OBSERVED
112/112	16/F	Metabolic Disease (T2D)	Metabolic Disease (T2D)	0.0%	67.2%	64.79	75.71	n/a	+10.92	alive at follow-up
116/116	5/M	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	0.0%	71.4%	70.53	84.81	2.75	+14.28	deceased (NDI)
122/122	64/M	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	0.0%	71.4%	18.08	28.33	2.58	+10.25	deceased (NDI)
129/129	63/M	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	8.6%	71.4%	18.84	29.22	n/a	+10.39	alive at follow-up
130/130	59/M	Heart Disease (CVD)	Heart Disease (CVD)	16.0%	72.4%	22.01	33.18	26.67	+11.18	deceased (NDI)
136/136	53/M	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	17.23	23.99	1.92	+6.76	deceased (NDI)
139/139	12/M	Metabolic Disease (T2D)	Metabolic Disease (T2D)	0.0%	67.2%	64.33	76.72	8.25	+12.38	deceased (NDI)
146/146	14/F	Heart Disease (CVD)	Heart Disease (CVD)	12.2%	72.4%	66.65	79.17	1.00	+12.53	deceased (NDI)
148/148	77/M	Brain (tumour / stroke)	Brain (tumour / stroke)	14.5%	75.5%	6.88	8.70	7.83	+1.82	deceased (NDI)
150/150	65/M	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	11.66	15.57	8.25	+3.92	deceased (NDI)
151/151	84/F	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	5.46	6.55	n/a	+1.09	alive at follow-up
153/153	44/M	Metabolic Disease (T2D)	Metabolic Disease (T2D)	0.0%	67.2%	35.09	45.83	14.67	+10.74	deceased (NDI)
158/158	29/F	Liver Disease	Liver Disease	0.0%	83.7%	30.91	48.18	n/a	+17.27	alive at follow-up

SUBJECT/ADM	AGE/SEX	ADMISSION DIAGNOSIS	ORACLE	PRESCRIBED RR	MAX ACHIEVABLE RR	USUAL-CARE BASELINE LY	PARETO-OPTIMUM LY	ACTUAL LY (OBS.)	Δ YEARS ADDED	OBSERVED
162/162	63/F	Metabolic Disease (T2D)	Metabolic Disease (T2D)	0.0%	67.2%	21.41	30.23	3.08	+8.82	deceased (NDI)
163/163	63/F	Metabolic Disease (T2D)	Metabolic Disease (T2D)	10.8%	67.2%	21.41	30.23	n/a	+8.82	alive at follow-up
164/164	51/F	Metabolic Disease (T2D)	Metabolic Disease (T2D)	0.0%	67.2%	31.92	41.56	n/a	+9.64	alive at follow-up
165/165	9/M	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	0.0%	71.4%	67.00	80.97	24.33	+13.97	deceased (NDI)
168/168	65/M	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	8.6%	71.4%	17.32	27.44	22.83	+10.12	deceased (NDI)
178/178	60/M	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	0.0%	71.4%	21.20	31.94	1.83	+10.74	deceased (NDI)
187/187	71/F	Metabolic Disease (T2D)	Metabolic Disease (T2D)	21.0%	67.2%	15.11	23.05	5.67	+7.94	deceased (NDI)
188/188	38/F	Metabolic Disease (T2D)	Metabolic Disease (T2D)	0.0%	67.2%	44.11	54.23	n/a	+10.12	alive at follow-up
189/189	75/F	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	8.72	11.20	n/a	+2.48	alive at follow-up
191/191	69/M	Brain (tumour / stroke)	Brain (tumour / stroke)	0.0%	75.5%	9.80	13.08	6.50	+3.28	deceased (NDI)
194/194	44/F	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	23.68	33.80	n/a	+10.12	alive at follow-up
197/197	74/M	Heart Disease (CVD)	Heart Disease (CVD)	0.0%	72.4%	11.20	20.09	n/a	+8.90	alive at follow-up
205/205	40/F	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	0.0%	71.4%	42.21	53.39	21.75	+11.18	deceased (NDI)

SUBJECT/ADM	AGE/SEX	ADMISSION DIAGNOSIS	ORACLE	PRESCRIBED RR	MAX ACHIEVABLE RR	USUAL-CARE BASELINE LY	PARETO-OPTIMUM LY	ACTUAL LY (OBS.)	Δ YEARS ADDED	OBSERVED
206/206	50/M	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	18.72	26.25	17.25	+7.53	deceased (NDI)
208/208	1/M	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	43.83	64.53	9.50	+20.70	deceased (NDI)
217/217	18/F	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	0.0%	71.4%	62.93	74.95	n/a	+12.01	alive at follow-up
225/225	79/M	Heart Disease (CVD)	Heart Disease (CVD)	16.7%	72.4%	8.38	16.22	4.33	+7.83	deceased (NDI)
230/230	3/F	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	45.38	66.89	25.75	+21.51	deceased (NDI)
237/237	81/F	Cancer (cause-specific mortality)	Cancer (cause-specific mortality)	0.0%	74.1%	6.45	7.93	9.83	+1.48	deceased (NDI)
239/239	69/F	Heart Disease (CVD)	Heart Disease (CVD)	16.0%	72.4%	16.62	26.04	11.50	+9.42	deceased (NDI)
255/255	18/F	Pulmonary (COPD/IPF/PAH)	Pulmonary (COPD/IPF/PAH)	0.0%	71.4%	62.93	74.95	n/a	+12.01	alive at follow-up
257/257	75/F	Heart Disease (CVD)	Heart Disease (CVD)	26.9%	72.4%	12.29	20.79	n/a	+8.50	alive at follow-up

... 21284 more admissions

04 Aggregate roll-up (cells <6 suppressed, mirroring enclave release rules)

21344
admissions processed

6
early-death oracles exercised

181626
total life-yrs added (Pareto − usual care)

7355
observed in-hospital deaths

ORACLE	N	MEAN MAX-ACHIEVABLE RR	MEAN LIFE-YRS ADDED/ADM	TOTAL LIFE-YRS ADDED	OBSERVED IN-HOSP DEATHS
Cancer (cause-specific mortality)	5920	74.1%	5.63	33349	2111
Metabolic Disease (T2D)	4386	67.2%	9.52	41754	1246
Heart Disease (CVD)	4141	72.4%	10.26	42482	1798
Pulmonary (COPD/IPF/PAH)	3200	71.4%	10.97	35118	903
Brain (tumour / stroke)	2270	75.5%	7.01	15906	1100
Liver Disease	1427	83.7%	9.12	13017	197

04b Roll-up by family × disease × subtype × stage (stage computed from response-module labs where a validated algorithm exists; else NA-stage)

The same statistics as the per-family table above, resolved to a finer grain. Each **family** (oracle) row carries its family-total record count and statistics; beneath it, every **disease** within the family — read from the actual NHANES condition flags (e.g. cardiac splits into congestive heart failure, coronary heart disease, angina and heart attack; pulmonary into COPD, emphysema and chronic bronchitis; liver into its reported items) — is broken out, then any recorded **subtype** (diabetes sub-item or cancer site, where the cycle asks it) and **stage**. Where a person reports several conditions in one family they are attributed to the highest-priority flag, so per-disease counts sum exactly to the family total. NHANES does not **report** a clinical stage, so this build **computes** one from the response-module labs for the four oracles with a validated cross-sectional algorithm: kidney → **KDIGO G-stage** (CKD-EPI 2021 eGFR), liver → **FIB-4** fibrosis band, metabolic → **ADA** glycaemic stage, pulmonary → **GOLD** (where spirometry exists). Oracles with no NHANES staging analog (cancer/heart/brain — no TNM, NYHA, or Child-Pugh) remain `NA-stage`. Computed stages are **single-visit categorisations** (chronicity unconfirmable), not chronicity-confirmed diagnoses; an explicit `variant_stage` column still overrides them. Cells with fewer than 6 records are suppressed, mirroring enclave release rules.

FAMILY	DISEASE	SUBTYPE	STAGE	N	MEAN MAX-ACHIEVABLE RR	MEAN LIFE-YRS ADDED/REC	TOTAL LIFE-YRS ADDED	OBSERVED DEATHS	MEAN AGE	MEAN ACTUALLY (DECEDENTS)	MEAN USUAL-CARE LE	MEAN PARETO LE	MEAN Δ LE
Cancer (cause-specific mortality) — *family total*				**5920**	74.1%	5.63	+33349	2111	61.5	8.07	14.79	20.42	5.63
	Malignancy — ever told	—	NA-stage	*<6*	*— suppressed (n<6, enclave rule) —*								
	Malignancy — ever told	Bladder	NA-stage	121	74.1%	2.66	+322	45	73.6	7.69	8.89	11.55	2.66
	Malignancy — ever told	Blood	NA-stage	11	74.1%	4.97	+55	6	62.6	3.24	13.63	18.61	4.97
	Malignancy — ever told	Bone	NA-stage	31	74.1%	5.90	+183	10	59.7	7.82	15.37	21.26	5.90
	Malignancy — ever told	Brain	NA-stage	21	74.1%	7.48	+157	5	53.6	4.08	18.45	25.93	7.48
	Malignancy — ever told	Breast	NA-stage	794	74.1%	4.14	+3289	227	68.0	8.20	11.94	16.08	4.14
	Malignancy — ever told	Cervix	NA-stage	327	74.1%	9.22	+3016	55	47.3	9.15	21.91	31.13	9.22
	Malignancy — ever told	Colon	NA-stage	347	74.1%	3.26	+1132	127	71.1	6.74	10.12	13.38	3.26
	Malignancy — ever told	Esophagus	NA-stage	28	74.1%	3.53	+99	11	68.6	2.47	10.71	14.24	3.53
	Malignancy — ever told	Gallbladder	NA-stage	*<6*	*— suppressed (n<6, enclave rule) —*								
	Malignancy — ever told	Kidney	NA-stage	93	74.1%	3.71	+345	33	68.9	6.60	11.00	14.71	3.71
	Malignancy — ever told	Larynx/windpipe	NA-stage	25	74.1%	4.08	+102	7	66.6	5.93	11.79	15.87	4.08
	Malignancy — ever told	Leukemia	NA-stage	51	74.1%	5.87	+300	15	59.9	5.26	15.29	21.16	5.87
	Malignancy — ever told	Liver	NA-stage	24	74.1%	4.57	+110	11	64.5	2.85	12.81	17.39	4.57
	Malignancy — ever told	Lung	NA-stage	133	74.1%	3.68	+489	60	68.7	5.81	11.01	14.69	3.68

FAMILY	DISEASE	SUBTYPE	STAGE	N	MEAN MAX-ACHIEVABLE RR	MEAN LIFE-YRS ADDED/REC	TOTAL LIFE-YRS ADDED	OBSERVED DEATHS	MEAN AGE	MEAN ACTUALLY (DECEDENTS)	MEAN USUAL-CARE LE	MEAN PARETO LE	MEAN Δ LE
	Malignancy — ever told	Lymphoma/Hodgkin	NA-stage	108	74.1%	6.43	+695	29	57.6	5.92	16.43	22.86	6.43
	Malignancy — ever told	Melanoma	NA-stage	291	74.1%	4.33	+1259	66	66.3	7.73	12.26	16.59	4.33
	Malignancy — ever told	Mouth/tongue/lip	NA-stage	30	74.1%	4.27	+128	12	66.5	5.76	12.14	16.41	4.27
	Malignancy — ever told	NA	NA-stage	756	74.1%	14.04	+10613	611	29.0	9.58	31.08	45.12	14.04
	Malignancy — ever told	Nervous system	NA-stage	*<6*	*— suppressed (n<6, enclave rule) —*								
	Malignancy — ever told	Other	NA-stage	222	74.1%	5.15	+1144	61	62.9	6.49	13.89	19.05	5.15
	Malignancy — ever told	Ovary	NA-stage	114	74.1%	6.82	+778	28	56.9	7.95	17.23	24.05	6.82
	Malignancy — ever told	Pancreas	NA-stage	12	74.1%	4.21	+51	5	66.5	3.22	12.13	16.34	4.21
	Malignancy — ever told	Prostate	NA-stage	786	74.1%	2.65	+2082	257	72.9	7.19	8.89	11.54	2.65
	Malignancy — ever told	Rectum	NA-stage	22	74.1%	3.26	+72	7	71.1	16.02	10.21	13.47	3.26
	Malignancy — ever told	Skin (non-melanoma)	NA-stage	752	74.1%	3.98	+2994	194	67.8	8.38	11.57	15.55	3.98
	Malignancy — ever told	Skin (type unknown)	NA-stage	391	74.1%	3.54	+1382	125	69.8	7.49	10.67	14.20	3.54
	Malignancy — ever told	Soft tissue	NA-stage	12	74.1%	5.67	+68	3	60.7	6.44	15.01	20.68	5.67
	Malignancy — ever told	Stomach	NA-stage	42	74.1%	4.70	+198	17	64.9	6.88	13.04	17.74	4.70
	Malignancy — ever told	Testis	NA-stage	30	74.1%	6.75	+203	8	54.7	8.93	17.07	23.82	6.75
	Malignancy — ever told	Thyroid	NA-stage	96	74.1%	6.73	+646	14	56.8	6.64	17.05	23.78	6.73

FAMILY	DISEASE	SUBTYPE	STAGE	N	MEAN MAX-ACHIEVABLE RR	MEAN LIFE-YRS ADDED/REC	TOTAL LIFE-YRS ADDED	OBSERVED DEATHS	MEAN AGE	MEAN ACTUALLY (DECEDENTS)	MEAN USUAL-CARE LE	MEAN PARETO LE	MEAN Δ LE
	Malignancy — ever told	Unknown	NA-stage	37	74.1%	5.68	+210	7	61.5	12.37	14.88	20.57	5.68
	Malignancy — ever told	Uterus	NA-stage	209	74.1%	5.79	+1210	52	61.1	8.44	15.20	20.99	5.79
Metabolic Disease (T2D) — *family total*				**4386**	67.2%	9.52	+41754	1246	50.8	10.86	31.62	41.14	9.52
	Diabetes mellitus	—	Diabetes	2381	67.2%	9.18	+21865	417	57.7	9.40	25.20	34.39	9.18
	Diabetes mellitus	—	Prediabetes	778	67.2%	9.13	+7100	197	57.0	11.33	26.15	35.28	9.13
	Diabetes mellitus	—	NA-stage	649	67.2%	10.55	+6844	327	30.3	11.04	50.44	60.99	10.55
	Diabetes mellitus	—	Normoglycemic	578	67.2%	10.29	+5945	305	37.0	12.38	44.25	54.54	10.29
Heart Disease (CVD) — *family total*				**4141**	72.4%	10.26	+42482	1798	57.5	8.36	25.99	36.25	10.26
	Angina pectoris	—	NA-stage	483	72.4%	9.87	+4770	120	63.3	8.42	20.99	30.86	9.87
	Congestive heart failure	—	NA-stage	1700	72.4%	10.47	+17796	899	54.2	7.68	29.05	39.51	10.47
	Coronary heart disease	—	NA-stage	1063	72.4%	9.54	+10138	302	67.4	8.23	17.22	26.76	9.54
	Heart attack (MI)	—	NA-stage	895	72.4%	10.93	+9778	477	49.1	9.71	33.30	44.23	10.93
Pulmonary (COPD/IPF/PAH) — *family total*				**3200**	71.4%	10.97	+35118	903	44.5	11.00	37.52	48.50	10.97
	Chronic bronchitis	—	NA-stage	1852	71.4%	11.16	+20668	456	41.0	13.34	40.73	51.89	11.16
	Chronic bronchitis	—	No-obstruction	416	71.4%	11.22	+4668	82	41.7	12.40	39.94	51.16	11.22
	Chronic bronchitis	—	Obstruction	86	71.4%	10.43	+897	12	55.4	9.88	27.31	37.73	10.43
	COPD	—	NA-stage	254	71.4%	9.89	+2511	37	61.7	2.16	22.03	31.91	9.89

FAMILY	DISEASE	SUBTYPE	STAGE	N	MEAN MAX-ACHIEVABLE RR	MEAN LIFE-YRS ADDED/REC	TOTAL LIFE-YRS ADDED	OBSERVED DEATHS	MEAN AGE	MEAN ACTUALLY (DECEDENTS)	MEAN USUAL-CARE LE	MEAN PARETO LE	MEAN Δ LE
	Emphysema	—	NA-stage	477	71.4%	10.75	+5126	269	47.8	8.50	34.33	45.07	10.75
	Emphysema	—	No-obstruction	70	71.4%	11.28	+790	35	42.4	7.59	38.87	50.15	11.28
	Emphysema	—	Obstruction	45	71.4%	10.21	+459	12	60.9	6.99	21.87	32.08	10.21
Brain (tumour / stroke) — *family total*				**2270**	75.5%	7.01	+15906	1100	57.5	7.68	16.32	23.33	7.01
	Stroke	—	NA-stage	2270	75.5%	7.01	+15906	1100	57.5	7.68	16.32	23.33	7.01
Liver Disease — *family total*				**1427**	83.7%	9.12	+13017	197	52.4	8.87	18.29	27.42	9.12
	Liver condition (legacy item)	—	F0-F1	766	83.7%	11.09	+8497	82	46.0	11.50	21.38	32.48	11.09
	Liver condition (legacy item)	—	Indeterminate	416	83.7%	6.36	+2647	54	61.3	8.87	13.98	20.35	6.36
	Liver condition (legacy item)	—	F3-F4	130	83.7%	5.95	+773	43	62.5	4.90	13.29	19.23	5.95
	Liver condition (legacy item)	—	NA-stage	115	83.7%	9.57	+1100	18	51.1	6.42	18.97	28.54	9.57

04c Lab-derived disease staging (whole loaded cohort — independent of self-reported diagnosis)

Every loaded participant who has the required **response-module** labs is staged across all 18 validated algorithms — **not** gated by self-report or by routing to a mortality oracle, and **not** subject to the §04b small-cell suppression. This is the population-level staging the lab data actually supports: a person with eGFR 40 is CKD G3b whether or not they reported kidney disease. Requires `demographics` + `response` module CSVs. Stages are single-visit categorisations (chronicity unconfirmable). If the table is empty, the diagnostic line below states why.

Response labs detected: **RIDEXPRG, RIDRETH1** · participants with ≥1 staging lab: **101,316** / 101,317 · with ≥1 computed stage: **91,562**

DISEASE / ALGORITHM	STAGE	N	% OF STAGED	DISTRIBUTION
CKD (KDIGO G-stage) *n=64,243*	G1	44,785	69.7%	
	G2	14,991	23.3%	
	G3a	2,847	4.4%	
	G3b	1,129	1.8%	
	G4	326	0.5%	
	G5	165	0.3%	
CKD albuminuria (A-stage) *n=79,759*	A1	69,570	87.2%	
	A2	8,702	10.9%	
	A3	1,487	1.9%	
Diabetes / prediabetes (ADA) *n=65,341*	Normoglycemic	39,684	60.7%	
	Prediabetes	18,695	28.6%	
	Diabetes	6,962	10.7%	
Liver fibrosis (FIB-4) *n=64,001*	F0-F1	49,169	76.8%	
	Indeterminate	13,008	20.3%	
	F3-F4	1,824	2.8%	
Liver fibrosis (APRI) *n=64,001*	F0-F1	61,098	95.5%	
	Indeterminate	2,623	4.1%	
	F4	159	0.2%	
	F2-F3	121	0.2%	
Liver fibrosis (NAFLD FS) *n=62,998*	F0-F2	40,056	63.6%	
	Indeterminate	18,265	29.0%	
	F3-F4	4,677	7.4%	

DISEASE / ALGORITHM	STAGE	N	% OF STAGED	DISTRIBUTION
Hepatic steatosis (FLI) *n=61,335*	S0	25,600	41.7%	
	S+	23,522	38.4%	
	Indeterminate	12,213	19.9%	
Hypertension (ACC/AHA 2017) *n=73,784*	Normal	42,065	57.0%	
	Stage 1	11,061	15.0%	
	Elevated	10,003	13.6%	
	Stage 2	9,829	13.3%	
	Crisis	826	1.1%	
ASCVD 10-yr risk (PCE) *n=27,897*	Low	13,858	49.7%	
	Intermediate	7,972	28.6%	
	Borderline	3,373	12.1%	
	High	2,694	9.7%	
Metabolic syndrome (2009) *n=70,506*	MetS-	54,811	77.7%	
	MetS+	15,695	22.3%	
Anemia (WHO) *n=83,298*	None	69,883	83.9%	
	Mild	11,469	13.8%	
	Moderate	1,873	2.2%	
	Severe	73	0.1%	
Obesity (BMI class) *n=88,195*	Normal	27,634	31.3%	
	Overweight	21,406	24.3%	
	Underweight	17,590	19.9%	
	Obese I	12,317	14.0%	
	Obese II	5,407	6.1%	
	Obese III	3,841	4.4%	

DISEASE / ALGORITHM	STAGE	N	% OF STAGED	DISTRIBUTION
Hyperuricemia *n=64,231*	Normal	53,031	82.6%	
	Hyperuricemia	11,200	17.4%	
Thyroid (cycle-limited) *n=15,247*	Euthyroid	14,214	93.2%	
	Subclinical-hyper	411	2.7%	
	Subclinical-hypo	352	2.3%	
	Overt-hypo	252	1.7%	
	Overt-hyper	18	0.1%	
Hepatitis B status (cycle-limited) *n=79,361*	Susceptible	52,363	66.0%	
	Immune-vaccine	23,117	29.1%	
	Immune-natural	2,750	3.5%	
	Isolated-core	860	1.1%	
	Chronic/active	271	0.3%	
COPD airflow (spirometry cycles) *n=20,050*	No-obstruction	18,118	90.4%	
	Obstruction	1,932	9.6%	

05 Actual vs usual-care baseline vs Pareto-optimum life-years ("years added")

The **usual-care baseline** is the standard of care: the empirical survival of patients with this disease who received ordinary treatment, including medications taken in the recent past (e.g. a statin they were already on). It is *not* an untreated counterfactual — there is no plausible untreated cohort to estimate it from. The **Bayesian Pareto optimum** is a different, specified set of interventions. So this table compares two regimens — **standard of care** vs the **Pareto-optimum set** — and the **years added** is `Pareto-optimum LE - usual-care baseline LE`. A high disease-specific acute first-year mortality is carried by both regimens; the Pareto set acts on the modifiable post-acute hazard. Observed **actual** life-years (from `dod - admittime`) are shown as the empirical anchor.

8.9	24.2	32.7	+181626
mean actual life-yrs (observed)	mean usual-care baseline life-yrs (standard of care)	mean Pareto-optimum life-yrs	total Δ years added (Pareto − usual care)

ORACLE	N	AVG AGE @ INTERVENTION	AVG AGE @ DEATH	AVG ACTUAL LY (OBS.)	USUAL-CARE BASELINE LY	PARETO-OPTIMUM LY	AVG Δ YEARS ADDED
Cancer (cause-specific mortality)	5920	61.5	67.6	8.07	14.79	20.42	+5.63
Metabolic Disease (T2D)	4386	50.8	54.8	10.86	31.62	41.14	+9.52
Heart Disease (CVD)	4141	57.5	60.1	8.36	25.99	36.25	+10.26
Pulmonary (COPD/IPF/PAH)	3200	44.5	51.9	11.00	37.52	48.50	+10.97
Brain (tumour / stroke)	2270	57.5	59.5	7.68	16.32	23.33	+7.01
Liver Disease	1427	52.4	65.7	8.87	18.29	27.42	+9.12

(sequential, earliest first)

The §05 figure above, recomputed within each consecutive 5-year window of the survey series from the earliest date present (1995–2019). Same definitions; per-oracle cells with n<6 are suppressed. Survey period read from column `SDDSRVYR` (cycle→start-year).

1995–1999 SURVEY PERIOD

9,135 routed records · 6 oracles exercised

11.2	31.0	40.8	+9.8
mean actual LY (observed)	mean usual-care baseline LY	mean Pareto-optimum LY	mean Δ years added

ORACLE	N	AVG AGE @ INTERVENTION	AVG AGE @ DEATH	AVG ACTUAL LY (OBS.)	USUAL-CARE BASELINE LY	PARETO-OPTIMUM LY	AVG Δ YEARS ADDED
Cancer (cause-specific mortality)	2305	54.2	56.4	10.96	18.49	26.03	+7.55
Heart Disease (CVD)	1913	47.8	47.7	10.33	34.67	45.62	+10.94
Metabolic Disease (T2D)	1820	42.2	46.7	12.77	39.56	49.52	+9.96
Pulmonary (COPD/IPF/PAH)	1637	36.8	45.4	12.60	44.35	55.79	+11.43
Brain (tumour / stroke)	1083	48.2	48.2	9.14	20.83	30.39	+9.56
Liver Disease	377	50.6	62.9	14.48	19.22	28.94	+9.72

2000–2004 SURVEY PERIOD

1,987 routed records · 6 oracles exercised

7.4
mean actual LY (observed)

18.4
mean usual-care baseline LY

25.7
mean Pareto-optimum LY

+7.4
mean Δ years added

ORACLE	N	AVG AGE @ INTERVENTION	AVG AGE @ DEATH	AVG ACTUAL LY (OBS.)	USUAL-CARE BASELINE LY	PARETO-OPTIMUM LY	AVG Δ YEARS ADDED
Cancer (cause-specific mortality)	595	67.9	81.9	7.03	11.80	15.94	+4.13
Heart Disease (CVD)	455	68.9	80.7	7.14	16.38	25.62	+9.24
Metabolic Disease (T2D)	343	56.3	75.4	8.40	26.62	35.81	+9.19
Pulmonary (COPD/IPF/PAH)	259	51.5	77.6	7.90	31.48	41.93	+10.44
Brain (tumour / stroke)	200	68.5	80.6	7.62	11.23	15.42	+4.19
Liver Disease	135	51.2	70.2	8.84	18.71	28.09	+9.38

2005–2009 SURVEY PERIOD

2,743 routed records · 6 oracles exercised

6.0	19.4	27.0	+7.6
mean actual LY (observed)	mean usual-care baseline LY	mean Pareto-optimum LY	mean Δ years added

ORACLE	N	AVG AGE @ INTERVENTION	AVG AGE @ DEATH	AVG ACTUAL LY (OBS.)	USUAL-CARE BASELINE LY	PARETO-OPTIMUM LY	AVG Δ YEARS ADDED
Cancer (cause-specific mortality)	848	65.8	80.2	5.65	12.63	17.15	+4.52
Metabolic Disease (T2D)	582	56.8	73.9	6.95	26.05	35.27	+9.22
Heart Disease (CVD)	515	65.5	77.6	6.00	18.86	28.59	+9.72
Pulmonary (COPD/IPF/PAH)	331	51.6	75.2	6.44	31.14	41.68	+10.54
Brain (tumour / stroke)	261	64.9	77.3	5.47	12.73	17.70	+4.97
Liver Disease	206	51.2	66.4	6.36	18.92	28.43	+9.52

2010–2014 SURVEY PERIOD

3,515 routed records · 6 oracles exercised

3.8	19.7	27.4	+7.7
mean actual LY (observed)	mean usual-care baseline LY	mean Pareto-optimum LY	mean Δ years added

ORACLE	N	AVG AGE @ INTERVENTION	AVG AGE @ DEATH	AVG ACTUAL LY (OBS.)	USUAL-CARE BASELINE LY	PARETO-OPTIMUM LY	AVG Δ YEARS ADDED
Cancer (cause-specific mortality)	1035	64.9	77.7	3.59	12.95	17.61	+4.66
Metabolic Disease (T2D)	745	56.8	71.3	4.30	25.99	35.25	+9.26
Heart Disease (CVD)	604	64.4	75.2	3.78	19.75	29.59	+9.83
Pulmonary (COPD/IPF/PAH)	463	51.3	69.4	4.05	31.30	41.89	+10.59
Brain (tumour / stroke)	345	65.9	76.4	3.81	12.20	16.87	+4.67
Liver Disease	323	53.5	66.5	4.43	17.76	26.54	+8.78

2015–2019 SURVEY PERIOD

3,964 routed records · 6 oracles exercised

1.7	18.9	26.4	+7.5
mean actual LY (observed)	mean usual-care baseline LY	mean Pareto-optimum LY	mean Δ years added

ORACLE	N	AVG AGE @ INTERVENTION	AVG AGE @ DEATH	AVG ACTUAL LY (OBS.)	USUAL-CARE BASELINE LY	PARETO-OPTIMUM LY	AVG Δ YEARS ADDED
Cancer (cause-specific mortality)	1137	66.7	74.3	1.70	12.14	16.39	+4.25
Metabolic Disease (T2D)	896	57.3	74.1	1.73	25.68	34.86	+9.17
Heart Disease (CVD)	654	65.5	75.0	1.77	18.65	28.43	+9.78
Pulmonary (COPD/IPF/PAH)	510	54.4	71.3	1.58	28.46	38.85	+10.40
Liver Disease	386	54.2	64.3	1.67	17.36	25.88	+8.52
Brain (tumour / stroke)	381	65.3	75.9	1.87	12.36	17.11	+4.75

What the delta is — and the one caveat that remains. This compares the standard-of-care regimen to the Pareto-optimum set. The Pareto effect is applied multiplicatively to the usual-care hazard, so where the two regimens **overlap** — e.g. both include a statin — the model still credits that shared intervention, making the headline Δ an **upper bound on the incremental gain**. The clean, overlap-free version is in §06: the prescribed-vs-Pareto **headroom** measures the Pareto optimum relative to what the patient was *actually* given (from `PRESCRIPTIONS`), so it nets out the standard care already in the baseline. Two further notes: the Pareto set acts only on the post-acute hazard (a statin does not avert acute septic death), and observed actual LY runs below the usual-care baseline here because this demo cohort is **selected decedents** — the baseline reflects the disease group's realistic standard-of-care expectation, not this biased sample.

06 Doctor-prescribed vs Pareto-optimum (requires the PRESCRIPTIONS table)

The demo archive you may have loaded omits `PRESCRIPTIONS`. Load it (it ships with the full credentialed MIMIC-III, ~4.16M rows, and with the open 100-patient demo on PhysioNet) and this section activates: each admission's ordered drugs are string-matched (`DRUG` / `DRUG_NAME_GENERIC`) to the routed oracle's interventions, giving the **doctor-prescribed risk reduction**, the **gap to the Pareto optimum**, and a split of life-years into **already secured** by the prescribed protocol vs **remaining headroom**.

7.1%	72.7%	65.6%	+168932
mean doctor-prescribed RR	mean Pareto-optimum RR	mean unrealized gap	total headroom life-yrs to Pareto

ORACLE	N (WITH RX)	MEAN PRESCRIBED RR	MEAN PARETO RR	MEAN GAP (UNREALIZED)	MEAN YRS SECURED	MEAN HEADROOM YRS
Cancer (cause-specific mortality)	5920	1.0%	74.1%	73.0%	+0.08	+5.56
Metabolic Disease (T2D)	4386	8.2%	67.2%	59.0%	+0.70	+8.82
Heart Disease (CVD)	4141	18.9%	72.4%	53.5%	+1.67	+8.59
Pulmonary (COPD/IPF/PAH)	3200	2.2%	71.4%	69.2%	+0.20	+10.77
Brain (tumour / stroke)	2270	7.7%	75.5%	67.8%	+0.45	+6.56
Liver Disease	1427	5.4%	83.7%	78.3%	+0.41	+8.71

21344 admissions had prescriptions; 7777 had ≥1 drug mapping to a prevention-oracle intervention (the rest were acute ICU drugs that map to nothing).

Interpretation caveats. MIMIC `PRESCRIPTIONS` are *inpatient CPOE orders* during the stay — a mix of acute ICU drugs (pressors, sedatives, antibiotics, which map to no prevention oracle) and continued chronic medications (statins, antihypertensives, etc., which do). So the prescribed RR here is a **lower bound** on the true outpatient regimen and is **not adherence-weighted** (a single inpatient order ≠ chronic use). Lifestyle and procedural interventions (exercise, diet, weight loss, rehab) never appear in a drug table, so part of the "gap to Pareto" is structurally unmeasurable from prescriptions alone.

07 Methods & caveats

- **Routing & priority:** free-text admission `diagnosis` → oracle by keyword, in priority order: **lymphoma → cancer → transplant → sepsis/infection → brain → heart → liver → kidney → pulmonary → metabolic → all-cause (default)**. Co-occurring conditions route to the highest-priority match — e.g. `S/P LIVER TRANSPLANT` → transplant, `SEPSIS;PNEUMONIA` → all-cause (sepsis dominates). This priority is a deliberate, editable choice; free-text routing has irreducible ambiguity and a real run would validate it on a labelled sample.
- **Prescribed-protocol RR:** computed when a `PRESCRIPTIONS` table is loaded — drugs are string-matched (`DRUG`/`DRUG_NAME_GENERIC`, the standard MIMIC approach; production uses NDC→RxNorm→ATC) to the routed oracle's interventions. Without that table it shows `n/a`. See §06 for the prescribed-vs-Pareto split.
- **Max-achievable RR:** greedy Pareto over *all* the oracle's decreasing factors, using the atlas rho-corrected joint model $HR=\exp(\Sigma\ln(HR_i)\cdot(1-\rho))$, ρ=0.30. This is a counterfactual ceiling, not a prescribe-tomorrow figure.
- **Life-years (usual-care baseline vs Pareto-optimum set):** the **usual-care baseline** is the standard of care — disease-specific survival from literature on real, treated patients, so ordinary treatment (including recently-taken statins etc.) is already embedded; it is not an untreated counterfactual. **Phase 1** (acute, year 1) applies a disease-specific 1-year mortality m_1 (e.g. liver ≈0.50, cancer ≈0.55, sepsis/all-cause ≈0.40, heart ≈0.28) carried by both regimens. **Phase 2** (post-acute) applies a chronic disease hazard `h_long` plus the age/sex background; the Pareto set's joint HR multiplies only `h_long`. Remaining life-expectancy is the area under each survival curve; **years added = Pareto-optimum LE − usual-care baseline LE**.
- **Overlap caveat & the clean version:** because the Pareto HR is applied to the usual-care hazard, interventions common to both regimens (e.g. a statin already in standard care) are credited again — so the §05 Δ is an **upper bound on the incremental gain**. §06's prescribed-vs-Pareto **headroom** nets this out by measuring the Pareto optimum relative to the patient's actual prescribed drugs. Baseline m_1/`h_long` are representative literature values, not fit to this cohort; `qx` background is a Canadian general-population table.
- **Residual life-years caveats:** (a) the bundle acts only post-acute, so high-acute-mortality groups gain little; (b) the chronic-prevention HRs are transported from ambulatory trials to post-ICU survivors; (c) m_1/`h_long` are representative literature values, not fit to this cohort — a production version would calibrate them to disease-group survival (e.g. registry or full-MIMIC follow-up).
- **Observed outcome:** from ADMISSIONS `hospital_expire_flag` / PATIENTS `dod` — the only ground-truth mortality available; shown for context against the counterfactual.
- **Effect sizes** are a documented representative subset per oracle (sources listed in §2 on hover), re-expressed in portable JS; full sets live in the atlas dashboards.
- **Demo size & selection:** 100 patients, all with recorded deaths (SSA Death Master File) — not a representative survival cohort. De-identified ages >89 are stored shifted; clamped to 89 here.

- **Not for clinical or policy use.** Pipeline demonstration only.

08 Alternative (non-mortality) endpoints (records with no mortality endpoint)

Records are routed to a condition-specific endpoint (symptom score or biomarker). The figure is the **maximum-achievable** reduction in that endpoint — in its native unit and as a percentage of baseline — under the $\bar{\rho}$=0.30 correlation-corrected effect stack. These are **not** life-years and are not added to the mortality totals above. Symptom oracles (osteoarthritis + psychiatric, routed by self-reported condition / label) appear only when no mortality oracle owns the person; **depression** (PHQ-9 ≥10) and **LDL cholesterol** (measured ≥130 mg/dL) are measured endpoints that apply independently of mortality status, with baselines anchored to the loaded cohort. Effect sizes marked PROV are representative literature values pending reconciliation with the atlas dashboards.

ORACLE	N	ENDPOINT	BASELINE	MAX-ACHIEVABLE REDUCTION	% REDUCTION	INTERVENTIONS
Osteoarthritis (knee / hip)	18426	Pain — VAS 0–10	7.0	-5.7 VAS pts	-82.0%	23
LDL cholesterol PROV	10103	LDL-C	156.6	-129.8 mg/dL	-82.9%	8

28529 records routed to a condition-specific (non-mortality) endpoint. Figures are the **maximum-achievable** reduction (all interventions, $\bar{\rho}$=0.3 correlation-corrected) in the endpoint's native unit — **not** life-years. Symptom endpoints (OA + psychiatric via label) route only when no mortality oracle owns the person; **depression (PHQ-9 ≥10)** and **LDL (≥130 mg/dL)** are measured endpoints that apply independently. Baselines are cohort-anchored where a value is measured (PHQ-9, LDL), else representative. PROV = provisional literature effect sizes pending reconciliation with the atlas dashboards.

MIMIC-III Clinical Database (MIT Laboratory for Computational Physiology, Beth Israel Deaconess Medical Center), demo subset. Local processing; representative effect models. Not for clinical or policy use.