

Newborn care recommendations at 1,500 g and health through age five in Denmark

Bolero

Abstract

Registered research design and conditional interpretation policy; no outcomes observed.

Keywords: Pre-registration, research design

Newborn care recommendations at 1,500 g and health through age five in Denmark

Pre-registration: no experimental outcomes have been observed.

Study protocol and statistical analysis plan

1. Study identity and registration history

Title: Newborn care recommendations at 1,500 g and health through age five in Denmark. **Scientific version:** pre-data Blueprint, 2026-09-09 UTC / 2026-09-08 America/Chicago. **Type:** original quasi-experimental study using existing administrative records, with an adaptive closed graph. This is prospective specification of analyses of existing data, not prospective recruitment, a randomized trial or a source-faithful replication.

The supplied unexecuted v001 design is retained. Atom IDs 000004–000008 keep their scientific meanings and membership in Molecule 000001; native schema version 1 is preserved, while manifest/provenance identify the final scientific revision. The current amendment concerns manuscript allocation, visualization of existing cumulative horizons, outpatient recording semantics, terminology and deterministic output interfaces. No endpoint, estimator, subgroup, activation or local result state was added. [Scientific amendment](#) records changes and knowledge history. Earlier observational work had different estimands and IDs; it is not current authority.

Investigators, sponsor, funding, approval identifiers, intended journal and public registry deposit are not supplied. No OSF or other registration has been made by this

task. The native Atom protocols own exact experiment rules, and the Molecule owns complete membership and interpretation. This narrative explains those authorities; the final registration PDF must also include their full native scientific appendix and shared incorporated specifications.

2. Data existence, access and prior knowledge

The user supplies an explicit [47-table planning boundary](#), with no validated tables. The active study uses LPR_ADM, LPR_FOEDSLER, LPR_DIAG, LPR_BES, LPR_SKSUBE, BEF and DODSAASG. Metadata describe candidate fields, date ranges and recording rules. They do not show that extracts are mounted, fields populated, infants linked, score support adequate or outcomes sufficiently frequent. AMRUN is partial with unknown selection and is not required. No extra education, prescription, bilirubin-laboratory, specialist disability or LPR3 source is authorized.

During scientific design, the Blueprint role read the complete supplied scientific baseline, its source/search history, the actual upstream handoff findings, public schema and dated administrative/clinical sources. Published findings from the closest threshold/phototherapy literature and the selected exemplars were known. Deschmann et al. (2026) was first supplied through upstream source findings and then verified from full Methods during the Blueprint stage. No confidential rows or computed study outcome summaries were read. Temporary nonstudy inputs used to check inherited code are not observations. The supplied history does not establish investigator-wide absence of all earlier outcome knowledge; no broader claim is made.

Actual extract periods, recording completeness, code vintages, encryption namespaces, temporary/permanent infant linkage and death coverage must be established in the governed environment. Source interpretation and the cohort/score audit are recorded before downstream health outcomes are inspected. Documentation, validated data, an empirical result and a successful code test remain distinct evidence types.

3. Background, theory and importance

Clinical organization can change at a birthweight category even when biological vulnerability varies smoothly. The central policy question is the additional consequence of a care-recommendation schedule near 1,500 g, not whether broadly lighter infants have worse health. The dated 25 January 2012 Danish hyperbilirubinaemia guidance assigns different bilirubin action levels to neighboring weight bands. Its original Figure 2 is the institutional anchor, with ordinary clinical exceptions and overlapping labels at equality. The fixed primary year is 2013, allowing a transition year and fifth birthdays within the legacy hospital era.

Daysal et al.'s Danish threshold study supplies the closest eligibility/ITT precedent; its 33-page author manuscript, physical p.6 footnote 3 and p.7, explicitly proceeds without detailed early treatment information. That does not establish the same care regime in our later population. Its 1982–1993 cohort cannot be imported into an LPR_FOEDSLER series documented from 1995. Early health and neonatal thresholds are not novel in themselves.

External Danish phototherapy studies document BNGC/BNGC0 and incomplete hospital-dependent reporting. The Swedish 2026 study instead relates first-week treatment duration to later neonatal outcomes after excluding first-week deaths. Neither treatment-duration association identifies the current all-birth recommendation contrast. These studies motivate careful separation of clinical indication, receipt, survival and recording, not an expected effect sign.

Additional care could reduce mortality and later morbidity; it could also create more survival opportunity or more intensive detection. Admissions can reflect illness, access and clinical decisions together. These alternatives justify distinct survival, acute respiratory and persistent neurological recording domains, with recurrence, timing, joint states and death-or-event outcomes. A hospital-use sign alone is not a welfare ranking. The scope remains health through five; unsupported schooling and prescription outcomes are explicitly outside this boundary.

4. Research questions, hypotheses and claim scope

The primary question is whether assignment to the lower-weight recommendation schedule changes childhood health locally around 1,500 g among 2013 public-hospital liveborn infants. Three nondirectional confirmatory comparisons are retained: death before five (death5, Atom 006), any qualifying post-neonatal respiratory admission before five (resp5, Atom 007) and primary completed-contact epilepsy recording before five (neuro_epilepsy5, Atom 008). The statistical question for each is whether the curvature/dependence/observation-conditional confidence set resolves a direction relative to zero; no negligible-effect region is declared.

Atom 004 contributes the consequential shared measurement/assignment judgment. Atom 005 studies recorded implementation and use, with photo14 as its lead supplementary margin. Secondary ages, care endpoints, recurrence, cerebral-palsy recording, death-or-event composites, fixed score/phenotype/observation sensitivities, historical comparisons and observed gestation subsets remain supplementary. Gestation effect modification is exploratory because measured-stratum selection limits its population interpretation. A predeclared supplemental analysis is not automatically a confirmatory mechanism test.

Clinical directional language is conditional on meaningful operation of the recommendation, score alignment, continuity of counterfactual risk/recording, the smoothness restriction and dependence assumptions. Care recordings neither gate clinical testing nor supply an IV denominator. No isolated phototherapy LATE, dose effect, biological birthweight effect, always-survivor effect, mediation fraction, cost-effectiveness or broad safety claim is registered.

5. Setting, population, eligibility and sampling

The unit is one infant birth event. The primary frame is all date-valid livebirth contacts at Danish public hospitals in calendar 2013. The fixed historical frame is 2010–2011, with identical measurement rules; 2012 is not estimated as an adoption year. Include all gestations and multiplicities. Infant entry never requires a mother

link, a BEF snapshot, discharge, neonatal survival, residence at a later horizon or completed follow-up.

Identify candidate infant contacts from ADM and DIAG. The date-valid hospital-born whitelist is DZ380/DZ383/DZ386 and documented hospital-born descendants, with C_HENM=8 (born here); broader DZ38* is the audit frame, not the target whitelist. D_INDDTO is time zero only on a validated infant birth contact, supported by V_ALDDG=0 or concordant BEF.FOED_DAG. Retain inpatient and outpatient births; a transfer is not a new birth, and a maternal delivery is not the infant. Home/en-route, stillbirth, nonbirth/maternal and unresolved-place records have distinct dispositions. A missing infant identity must not be solved by deleting early deaths.

LPR_FOEDSLER.V_VAGT supplies documented integer grams via the validated contact key. Preserve the 1,300–1,700 g inclusive roster for audits. The primary fit has strictly positive triangular weights only for $0 < |W - 1500| < 200$ g. Exactly 1,500 remains visible but is prospectively omitted from the primary fit; 1,300 and 1,700 have zero kernel weight. No diagnosis-derived weight, rescaling guess, imputation, rounding or broad 2,500 g treatment is substituted.

Follow-up starts at birth and ends at the relevant day horizon or birthday, with full five-year observation requiring calendar records through 31 December 2018. Administrative file completeness is a measured property, not an entry restriction. Half-open windows exclude an event on the birthday itself. February 29 birthdays map to February 28 in nonleap years. A date-only event on the death date may count; no within-day order is inferred.

The cohort size is data-determined, without a recruitment target or sample expansion for precision. Source/version/key/identity ambiguity, absent fields and inadequate score rank have the native distinct dispositions. See [data-contract.md](#) and Atom 004 for the full ordered cohort audit.

6. Exposure, assignment and comparison

Assignment is $Z=1(W < 1500)$, the lower-weight care schedule, versus the higher-weight schedule. Equality has no primary assignment. The 2012 guideline uses birthweight pragmatically for newborn care and changes to current weight after two weeks. Its post-day-three local plateau is 200 versus 250 $\mu\text{mol/L}$ for the chart's nonseverely-ill, nonisoimmunised schedule. Figure 1 is a documentary schematic, not a receipt first stage or clinical advice. Individual illness, haemolysis/isoimmunisation and other indications can alter clinical decisions.

The all-gestation estimand concerns this recommendation bundle with ordinary exceptions. Concurrent gestational eligibility can dilute or modify an average encouragement contrast without invalidating its definition. A uniformly meaningful causal interpretation still requires a real local recommendation contrast, smooth composition and credible score measurement. Missing details on every treatment component are not a universal bar to eligibility ITT; they do prevent receipt/dose/mediation claims.

Three conclusions must be distinguished. Importing the historical cohort or projecting an unchanged phototherapy rule through the earlier continuous-rule period is contradicted. Local implementation, equality and bedside/recorded-score alignment

remain pivotal unresolved facts. A 2013 recommendation contrast is defensible conditional on the stated institution and assumptions. No hospital/era subgroup is selected after outcomes to strengthen a first stage. A newly supplied dated rule applying a different/continuous schedule throughout the target setting contradicts the route; partial local exceptions qualify it. An unread document is not a contradiction.

Identification requires continuity of potential health/recording outcomes without the schedule, no selective score/infant capture, no discontinuous non-care cause and meaningful clinical use of the recommendation. Timing of delivery can respond to anticipated fetal weight; postnatal weighing/reweighing may be selective. Co-triggered care belongs to the bundle, while discontinuous provider sorting or another non-care cause threatens it. No baseline diagnostic proves these assumptions. Shared mother/hospital dependence is addressed separately from interference: grouping controls uncertainty, not a proof that one infant's eligibility cannot affect another's care. Any materially discontinuous cross-infant care allocation would limit the simple local bundle interpretation and must be reported, not resolved with a new estimator.

7. Outcomes, measurements and operationalization

All binary health endpoints use the original infant denominator. An outcome is an exact value or an interval $[L,U]$ over source-consistent possibilities. Known death or hospital events can settle parts of a history without a later resident snapshot. No unavailable source is replaced by an unauthorized register.

Scientific unit	Complete registered endpoint keys and windows	Construction and limit
005 Recorded care	photo14; photo28; inpatient_days28; outpa- tient_days1_cap20; outpatient_days1_uncapped	Date-valid BNGC/BNGC0 in SKSUBE with procedure date in infant contact/life; deduplicated within infant. Photo14 is [0,14 days), photo28 [0,28). Inpatient days union occupied calendar dates before day28, capped at28 and death-truncated. Outpatient visit-days use actual BES dates from day28 to birthday1, excluding initial inpatient birth-spell dates; cap20 for bounded inference, uncapped side means descriptive only.
006 Death	death28; death1; death3; death5	DODSAASG.D_DODSDATO; verify cumula- tive/historical/neonatal coverage despite the field-list date. Death strictly before horizon gives1; proven later life or later death gives0; otherwise complete vital ascertainment must be documented or outcome is [0,1]. No death from BEF disappearance.

Scientific unit	Complete registered endpoint keys and windows	Construction and limit
007 Respiratory	resp1; resp3; resp5 ; resp2plus5; resp3plus5; death_or_resp5	New acute inpatient qualifying spell starts at/after day28 and after the initial birth spell ends. Date-valid DJ12–DJ18/DJ20–DJ22 descendants, primary diagnosis A, acute model and inpatient type0 must coincide on a component contact. Union transfers separated by at most1 day; merge qualifying recurrences with gap 7 days. Retain 30-day gap and A/B diagnosis sensitivities. Recurrence is among births, not prior cases.
008 Neurological	neuro_epilepsy1; neuro_epilepsy3; neuro_epilepsy5 ; neuro_cp5; death_or_epilepsy5; death_or_cp5	Date-valid DG40* A/B diagnosis on completed inpatient contact, or completed outpatient contact with an actual BES date, before horizon. DG41 alone enters only DG40-or-DG41 sensitivity. DG80* is secondary hospital CP recording, not validated functional disability. Primary recording date is completion, not onset or admission.

Exact fields, units, contact keys, historical administrative values and code-date checks are in the incorporated data contract. DIAG, SKSUBE and BES are reduced before joining ADM, avoiding fan-out. VERSION and LEVERANCEDATO describe delivery/version, never event time; conflicting simultaneous versions or unidentified recodes remain unresolved. DODSAASG joins by resolved infant PNR with one consistent death date. No private records are placed in this package.

Outpatient measurement has an important dated limitation: from 2014 the official guide makes BES visit dates optional for acute outpatient contacts. Thus a complete diagnosis-bearing acute contact without BES contributes no BES visit-day and does not meet the primary outpatient neurological predicate. The already registered `neuro_timing` sensitivity includes every diagnosis-bearing contact, including that case. Completion before horizon establishes the sensitivity's recording; a contact spanning the horizon gives possible recording over `[start,end]`. This contrast jointly relaxes attendance support and timing. It is not a pure onset-delay estimate or a silently broadened primary phenotype. An absent BES delivery remains a separate coverage problem.

Respiratory death before day28 fixes post-neonatal occurrence at0; unknown follow-up yields bounds unless an event settles ever-occurrence. Initial birth spells can be empty for validated outpatient-only births. A spell starting before day28 does not become new merely by crossing day28. Unknown dates use minima/maxima over feasible completions satisfying the spell, episode, birth and death rules; conflicting constraints are unresolved, not a healthy empty record. Mortality cumulative bounds must be monotone at the child level.

Joint states for each morbidity domain are alive/no recorded event, alive/event, dead/no prior event, dead/event and unknown. Count bounds need not form a uniquely allocable composition. Death-or-event is1 if either is known,0 only if both absent, otherwise bounded. These are not outcomes within an always-survivor principal stratum. Same-date death/event recording does not establish temporal precedence within the day.

Ancillary gestation uses allowed maternal delivery `DIAG.C_TILDIAG` (dated `DUwwDd`) attached to action `DO80-84`, linked by consistent `BEF.MOR_ID` and an unambiguous delivery overlapping infant birth or closing within two days. Exact `d=0...6` supplies days; documented intervals classify `<224` versus `224` days only when wholly on one side. `DU99DX`, conflicts, invalid codes and intervals outside 140–315 days remain unknown. This plausibility guard never excludes infants from the primary cohort. `D_SMENDTO` is unused and `DP072/DP073` do not infer exact gestation. Sex, month, hospital, multiplicity and link missingness are diagnostics, not selected controls.

8. Evidence sequence and planned displays

Reader question	Registered producer / comparison	Display and encoding	What it can distinguish; remaining limit
What changes at 1,500 g?	004 documented rule	Main Figure 1: local recommendation levels with equality open	Dated recommendation versus assumed label; no observed adherence

Reader question	Registered producer / comparison	Display and encoding	What it can distinguish; remaining limit
Does the recorded score represent the target infants?	004 actual score and ancillary missingness	Main Figure 2: gram-frequency stems plus missingness points; Tables S1/S10	Heaping/support/composition; no proof of exchangeability
Which care recordings change?	005 photo14 and hospital-day profiles, all care outputs	Main Figure 3: paired score profiles/side-fit envelopes; Table S7	Coded treatment versus occupied time; no total receipt, mediation or welfare
How do age-five health domains compare?	006–008 three primary effects	Main Figure 4: common-scale risk-difference ranges and family/hospital sets	Survival versus acute/persistent recording; same denominator, distinct meanings
When are cumulative contrasts visible?	006–008 fixed day28/1/3/5 horizons	Main Figure 5: aligned age-axis panels with vertical intervals; Table S3	Earlier versus later accumulation; not annual effects, onset tests or a continuous curve
Can competing risk/recording explain mixed domains?	007/008 recurrence, composites and joint states; 005 context	Tables S3/S9 and main synthesis	Descriptive co-occurrence and death-or-event contrasts; no individual mediation or always-survivor effects
How dependent is the conclusion on assumptions?	Shared sensitivities, baseline and observation outputs	SI Figure S1: interval limits over M; Tables S4–S6/S8/S10/S11	Extrapolation/dependence/measurement limits; diagnostics do not prove causal assumptions

[blueprint.md](#) supplies paragraph locations, display units/scales/denominators, transitions and main/SI/protocol/engineering allocation. Figures 4–5 deliberately share age-five anchor estimates to answer different cross-domain and timing questions; no extra tests arise. No histogram, hazard, new subgroup or synthetic mechanism is invented for visual variety. Joint count bounds remain a table because a flow or stacked composition would imply unregistered ordering or unique allocation.

9. Estimands and statistical models

Set $x=(W-1500)/100$. The desired local contrast is the left limit minus the right limit of the conditional endpoint mean. Under continuity of counterfactual outcomes absent the recommendation change, it is a local recommendation-bundle effect. Since recorded W is discrete and equality omitted, that limit is not nonparametrically point identified from observed support. The finite-window weighted local-linear contrast and its curvature-conditional set are reported distinctly.

Use $k=\max(0,1-|x|/2)$ for the primary ± 200 g window, equality excluded. On each side, weighted least squares of Y on $(1,x)$ gives intercept weights. Concatenate the left intercept weights and negative right weights into a . Assert $\sum a=1$ and $\sum a x=0$ on the sides, and zero weighted x on each side, to numerical tolerance $1e-10$. At least two distinct positive-weight scores per side and full side rank are required. There are no outcome-selected covariates, control sets, polynomial order, bins, bandwidth or hospital exclusions.

For known Y , the contrast is $T=\sum a Y$. For interval outcomes, $T_{\text{low}}=\sum(a=0)aL+\sum(a<0)aU$; T_{high} reverses L/U . No midpoint is an estimate. Within each side, assume $|x| \leq M$ over the full window. The Taylor bound is $B(M)=M\sum |a|x^2/2$. This explicitly includes the omitted-score gap; deleting a donut cannot erase the need for extrapolation.

Scale inpatient days by 28 and capped outpatient days by 20 before applying bounded-outcome inference, and rescale their effects and sets to days for reporting. M is defined on that scaled endpoint. Uncapped outpatient days have only descriptive side means and no causal interval. Actual-score means and fitted completions are descriptive displays, not alternate estimators. Prediction weights use the same sign-aware envelope rule at each fixed 1 g grid point; those envelopes are not confidence bands.

The complete fixed score variants are `h100`, `h150`, `donut25`, `equality_right`, `equality_left` and `no50`, besides primary. The wider gap omits $|W-1500| \leq 25$ g; `no50` removes all multiples of 50 and changes the observed subpopulation. The alternative bandwidths retain their matching triangular kernel and the same scientific meaning. Insufficient support remains non-estimable. No favorable variant replaces the primary.

The fixed historical comparison covers `photo14` and the three primary age-five clinical endpoints in 2010–2011, with a descriptive difference from 2013. Known $<32/32$ and unknown gestation subsets cover the three age-five clinical endpoints, with a known-strata difference. Difference sets use first lower minus second upper and first upper minus second lower, with added constituent uncertainty; historical direction is 2013 minus 2010–2011 and gestation direction is 32 minus <32 . These are contextual/exploratory comparisons, not a reform DiD or an interaction in the entire birth population. Endpoint-specific phenotype and broader-observation variants remain those in their native protocols.

10. Uncertainty, multiplicity and design sensitivity

For dependence groups g , $b_g = \sum(i g) |a_i|$ and $H = \{\log(2/\sum b_g^2/2)\}^{1/2}$. With independent birth-family groups and arbitrary within-group dependence, bounded-outcome concentration yields a conservative sampling radius. The reported set is $[T_{\text{low}} - H - B(M), T_{\text{high}} + H + B(M)]$ intersected with the feasible risk-difference range $[-1, 1]$. An empty intersection is model conflict; a full feasible range is uninformative, not evidence of a null. Zero recorded events do not yield zero uncertainty.

Birth-family groups use consistent mother links and birth-hospital $\times$ birth-date groups for unlinked infants, with transitive closure so partial linkage cannot split known delivery groups. A separate hospital grouping connected by known cross-hospital mothers assesses dependence sensitivity. Independence between groups and unobserved cross-hospital links remain assumptions. Gram clustering is not a remedy for discrete-score misspecification. Dependence sensitivity affects claim strength, not the existence of a clinical analysis.

The reference $M = .05$ per $(100 g)^2$ allows a side tangent remainder of 0.10 at 200 g for a scaled bounded outcome. It is not a clinically validated upper bound. Retain $M = 0, .01, .025, .05, .10, .20$ and the continuous M at which zero first enters the interval (0 if already included; infinity if no widening slope). $M = 0$ assumes exact side-linearity. No newly available source calibrates this bound for all outcomes, and this stage does not replace it with a favorable smoother. Its possible lack of informativeness is an essential main-text limitation.

The three age-five primary endpoints each use $= .05/3$ (98 % marginal sets), giving at least 95% simultaneous coverage by the union bound under the stated assumptions. All three allocations survive nonactivation, missingness and non-estimability; α is never recycled. Secondary endpoints, horizons, strata, historical comparisons and fixed variants have 95% pointwise sets. For a 95% stratum/period difference use 97.5% constituent sets ($= .025$ each); independence of those estimates is not required. State selection for the primary endpoints uses the native first-match rules in §13, not a new graph based on p-values.

No equivalence margin, minimal clinically important effect or ex ante event rate has been justified. Schema and external sample counts do not establish power. After the score-only roster is constructed, $H + B(M)$ can describe design sensitivity without event access, along with effective $N = (\sum |a|)^2 / \sum a^2$ and largest group share. No sample expansion, cutoff switch or design selection follows from these quantities. Cumulative profiles are correlated supplemental evaluations; separate pointwise intervals do not test onset age or between-age differences.

11. Missingness, exclusions and competing events

The shared data contract fixes version resolution, contact/infant identity, permitted keys and duplicate rules. Exact duplicates may collapse with an audit; undocumented latest-row choice, majority-vote birth dates and guessed rekeying are not allowed. If birth units cannot be deduplicated, the cohort is unresolved. If an infant unit is identified but follow-up cannot be linked, retain interval outcomes where possible. Maternal or ancillary gestation missingness never becomes a complete-case primary restriction.

For a domestic public-hospital recording endpoint, complete linkable coverage with no qualifying record licenses zero for that recording predicate, including when illness abroad is possible. It does not license “healthy.” An incomplete eligible recording interval yields [0,1] unless known event/death settles the endpoint. The separate broader-health observation sensitivity treats intervals without affirmative residence evidence as potentially missing illness. BEF snapshots cannot fill exact migration gaps; no invented inverse-probability model or default missing-at-random assumption is used.

Mortality is 1 for death before horizon, 0 for proven life at/after horizon or later death; absent death recording is 0 only under documented complete vital ascertainment. Conflicting or prebirth death dates remain unresolved. DODSAASG supplies death truncation to care/morbidity independently of whether the mortality contrast can be estimated. A failed mortality Atom does not imply survival and does not block a known hospital event; unknown vital status propagates into composites/joint bounds.

Count occupancies and episodes over all date completions consistent with known dates/lifespan; do not fill an unknown discharge with administrative end-of-study. Same-day inpatient admission/discharge counts one occupied date. Lifespan-inconsistent contacts cannot become evidence after death. Death and disease are competing/overlapping recorded events, not independent censoring processes to be adjusted away. All exclusions, unresolved records and suppressed public cells retain reasons; a publication display never substitutes a fake zero or a mock result.

12. Diagnostics, sensitivity and rival explanations

Audit in order: dated rule/score meaning, contact and infant identity, dates/weights/code coverage, score support, then baseline composition/observation. Freeze that audit before health inspection. A first-stage p-value and clinical direction never select a cohort, hospital, endpoint or estimator.

Flag score concentration when at least 50% of window births lie on 50 g multiples, a nearest support gap exceeds 25 g on either side, or one birth-family group has over 20% of total absolute contrast weight. Show every gram including 1500, and 10/50/100 g heaping, by era and hospital where disclosure permits. These are fragility conventions, not proof of manipulation, and their absence does not prove an unselected running variable.

Baseline diagnostics include sex; exact gestation and <32/unknown status; hospital shares; birth month; multiplicity/unknown; and maternal-link missingness. For bounded quantities use 95% sets at $M=.05$; exact gestation uses days/315. Flag sex/missingness differences exceeding 0.10 and known preterm-share differences exceeding 0.15 when the diagnostic interval excludes 0. Flag exact gestation differences above 7 days with an excluding-zero interval. Hospital total variation exceeds 0.20 as a descriptive warning without a p-value. Month/multiplicity distributions have descriptive summaries, not invented scalar tests. These flags qualify the result; no empirical check gives unqualified exchangeability.

Fixed score variants and curvature/dependence sensitivities assess extrapolation, heaping and shared shocks. A no 50 or donut comparison does not establish that

manipulation has been removed. Care reporting across hospitals describes coding context, never a best-reporting-hospital selection rule. Respiratory A/B codes and episode gaps assess ascertainment and recurrence definitions. Neurological DG40/41 and timing/attendance envelopes assess recording scope. Broader-observation bounds challenge latent-health interpretations. The earlier period is not a no-care placebo; measured gestation strata are not complete biological classification.

The important unresolved facts are source applicability at local hospitals, bedside-versus-recorded weight, equality, infant linkage and delivered coverage. They retain the registered exact dispositions. Unknown future precision and optional gestation are not proof of impossibility. No additional estimator, negative-control cutoff, subgroup or mechanism is authorized merely because it would make a different figure.

13. Adaptive schedule and result-dependent decisions

The graph is closed before study outcome access. All five Atoms are members from the start. Atom 004 has activation `TRUE`. Each of 005,006,007,008 has exactly `(state(atom-000004) == "ready") OR (state(atom-000004) == "qualified")`. There are no clinical-to-clinical activation edges: survival precedes morbidity in interpretation, while death flags can be shared in construction without requiring a favorable or completed mortality estimate. A care first stage does not activate health. Narrative order, computational reuse and scientific activation are separate.

Native regions are **ordered first-match**, with a final otherwise. This table explains them without replacing their exact definitions.

Producer	Ordered local result partition	Disposition / implication
004	contradicted → data_gap → unresolved → qualified → ready → otherwise	Direct institutional/selective- recording contradiction stops the causal route; demonstrated absent mandatory input differs from unverified meaning. A defined roster with registered support/composition/local- practice concerns proceeds qualified. Readiness still retains causal assumptions. Rank insufficiency can qualify this shared audit and resolve locally as non-estimable down- stream. Otherwise leaves the route unresolved.
005	data_gap → partial → non_estimable → model_conflict → higher_recording → lower_recording → otherwise	All unavailable care differs from unavailable photo14 with other care evidence. With defined photo14 and estimable support, empty feasible set is conflict; a95% set wholly above/below zero classifies recorded phototherapy direction. Remaining direction is unresolved. Other care margins remain reported and never replace photo14 in state adjudication.

Producer	Ordered local result partition	Disposition / implication
Each clinical Atom 006-008	data_gap → unresolved → non_estimable → model_conflict → sensitivity_limited → lower → higher → otherwise	Defined primary set plus its fixed variants governs classification. Missing inputs/meaning/support/conflicting model precede direction. A primary directional set is sensitivity-limited if hospital or h100/h150/wider-gap evidence is unavailable or includes zero, or another registered 95% specification lies wholly in the opposite direction. Otherwise a primary set wholly below/above zero gives lower/higher under assumptions. The catch-all includes zero-spanning/full-range uncertainty, not equivalence.

Operational **no_result** is a terminal status, not a local scientific state. It does not satisfy **done** and is not a fabricated data gap. Unknown activation is unknown, not false. Completed input/assignment boundaries can scientifically prevent activation; failed computation can leave a member pending/blocked. Every unactivated member reports its trigger trace rather than vanishing from membership. No recovery edge or repeat debate is added.

All activated, feasible, prespecified clinical comparisons are mandatory and retained regardless of sign. The audit does not select favorable health outcomes; no multiplicity budget is redirected. Pretesting cannot be advertised as conditional coverage after accepting a favorable baseline, so inference remains explicitly for the fixed registered design with its qualifications. Direct-dispatch engineering may bypass only the outer activation check, never the scientific prerequisites or these result rules.

14. Interpretation under alternative results

Molecule restrictions have precedence over compatible endpoint-specific claims and supplementary interpretations. The residual rule reports remaining mixed, unresolved, inactive and operational scope. It is not an aggregate vote or a forced Cartesian classification.

- **Contradicted assignment:** identify the exact dated or validated score/recording conflict. The required quasi-experimental question is not answered under this route; an observational substitute is not successful completion.
- **Unresolved, unavailable or unexecuted assignment:** name which pivotal fact, required input or operation is missing. None is evidence of zero care variation or no health consequence.
- **Qualified assignment:** retain the named score/composition/local-practice restrictions alongside every later estimate. Favorable clinical directions cannot override them.
- **Clinical lower/higher:** state the endpoint literally. Lower death5 means fewer deaths before five. Lower respiratory/neurological recording does not by itself mean better latent health. Quantify the local contrast/range and assumptions, not an isolated phototherapy effect.
- **Sensitivity-limited direction:** identify the mandatory sensitivity that is unavailable, zero-compatible or opposing; do not call the result a robust causal finding. Report curvature frontier even when the reference set is directional.
- **Inconclusive sets:** report compatible ranges, possibly the full feasible range. No safety, equivalence, no-treatment or absent-benefit conclusion follows.
- **Mixed survival/morbidity:** fewer deaths with more recorded morbidity is compatible with extra survival opportunity or detection. More deaths with fewer diagnoses cannot establish healthier survivors. Consult recurrence, death-or-event and joint-state bounds, while retaining no always-survivor or mediation claim.
- **Recorded care:** more photo14 supports an observable implementation margin. Flat, negative, partial or missing recording cannot determine total receipt and never cancels the health family.
- **Timing:** state the fixed cumulative estimates/ranges and missing ages. Separate signs or pointwise intervals do not establish onset, reversal, an annual hazard or a between-age effect difference.
- **Historical/gestation comparisons:** any agreement, difference, imprecision or absence is reported with era and measured-subset limitations; neither selects the primary population or repairs its identification.

Full supported alternative Results/Discussion wording, exact slot bindings and boundary title/abstract dispositions are in [results-map.md](#). Main text receives only the applicable evidence-supported branch later; it presently contains neutral scientific reasoning and pending slots. Unfavorable evidence has the same reporting obligations as favorable evidence. The conclusion-changing institutional, score, curvature, dependence and recording caveats remain in main even when full displays are in SI.

15. Reproducibility, code and deviations

[execution/README.md](#) maps each retained Atom to its scientific protocol, required inputs, reference implementation and aggregate outputs. The registered sequence separates cohort and measurement construction, effect estimation, and display preparation. Activation-aware execution respects the native prerequisites; explicit direct

dispatch retains all scientific prerequisite checks. Separate synthetic cases assess implementation behavior, and their verification status is recorded in the execution handoff. Synthetic inputs remain outside the delivered package. The labelled hypothetical exhibits illustrate layout only; they do not populate result slots or supply an execution fallback.

Scientific definitions, sample, clocks, estimand, estimator, alpha and branches are frozen at this handoff. Meaning-preserving source adapters and engineering repairs are permitted with provenance. An unresolved scientific fact keeps its registered disposition rather than a guessed fallback. Any later scientific extension requires a timestamp, specific change/rationale and disclosure of all previously observed data/outcomes; it is not silently folded into original confirmatory work. Unknown deviations cannot be prospectively labelled accepted.

The pristine World is not a runtime results directory. Governed evidence is written through the runtime execution layout and later binds to the existing slots. Public aggregate outputs follow disclosure restrictions, with missing/suppressed reasons carried through. Exact source/version hashes and concise scientific amendments are delivered; raw papers, synthetic datasets, debate archives and operational QA logs are not.

16. Ethics, access and dissemination

This preparation uses public documentation and authorized local manuscript exemplars. It involved no participant contact or confidential record access. Actual governance/access approvals, identities, funding and disclosures must be supplied by the responsible research operator. No approval identifier, ethics exemption or registry deposition is inferred from another Danish paper.

STROBE/RECORD and structured-record transparency inform reporting of population, linkage, phenotypes, observation, missingness and limitations. They do not certify identification or require a randomized-trial label. This is not a TARGET-style target-trial emulation or a SPIRIT clinical trial. Treatment-effect reporting principles motivate explicit exposure/assignment and timing; no reporting framework overrides the allowed-table boundary or native estimand.

The package contains the native registrations, a combined main-text and SI manuscript, this protocol and statistical plan, reusable implementation and display sources, and explicitly labelled hypothetical previews. The manuscript and registration have separate scientific roles: the former develops the evidence argument, while the latter retains all prospective decisions and interpretation branches. Build and implementation verification are documented in the accompanying handoff. All empirical results remain pending until governed execution and evidentiary review.

References

Exact versions, source pages and access limitations are in [literature.md](#), [search-log.md](#) and the Blueprint's exemplar reflection. Pivotal sources are:

- Danish Paediatric Society (25 January 2012), [Behandlingsstandard for neonatal hyperbilirubinæmi](#), original Figure2 and pp.3–5.

- Daysal et al. (2022), [Spillover Effects of Early-Life Medical Interventions](#); 33-page [author manuscript](#), pp.6–7 for missing treatment detail and ITT.
- Sundhedsdatastyrelsen, [Fællesindhold 2014-2 VEJL](#), pp.33/38 optional acute out-patient visit dates; [2010 guide](#) for inherited birth/gestation documentation.
- Sun et al. (2023), [Neonatal Phototherapy and Clinical Characteristics](#); Sun et al. (2024), [Neonatal phototherapy and risk of epilepsy](#).
- Deschmann et al. (2026), [Phototherapy, Morbidity, and Mortality in Very Preterm Newborns](#), full Methods verified through PMC BioC; treatment-duration and survivor selection differ from this target.
- [Associations between multiple perinatal exposures and childhood hospitalisation with infection](#) (2025), inherited full-methods source for episode/timing context.
- Barreca et al. (2011), [Saving Babies? Revisiting the Effect of Very Low Birth Weight Classification](#); Kolesár and Rothe (2018), [Inference in Regression Discontinuity Designs with a Discrete Running Variable](#). The latter’s abstract-level methodological warning is not claimed as the exact implementation of the registered Taylor/concentration procedure.

The registration includes all five native protocols, local result partitions, the full Molecule registration and the incorporated data/identification material. The complete incorporated statistical specification is reproduced below because its precise formulas and output commitments govern every clinical experiment. The native appendix supplies execution-level scientific precision without repeating the full decision manual throughout the paper.

Incorporated statistical specification

The following is the complete shared statistical specification incorporated by the native protocols. It is reproduced without scientific alteration and supplies the exact estimator, uncertainty, variant and output interfaces. The preceding narrative explains these commitments; this appendix is not an additional analysis plan.

Registered estimation and interpretation

This shared specification is incorporated by all Atom protocols. Scientific choices below are fixed before study outcome access. Primary target population: hospital-born infants in 2013 locally around 1500 g, including all gestations and multiplicities. Historical 2010–2011 estimates and gestation subsets are supplementary; they never replace the 2013 primary population.

Assignment estimand and score assumptions

Let W be recorded birthweight in grams, $x = (W - 1500)/100$, and Z indicate the lower-weight recommendation. Let $Y(z)$ be the endpoint under assignment to recommendation schedule z , with ordinary clinical exceptions, referrals, labelling and co-triggered care. The desired local policy contrast is $= \lim_{x \uparrow 0} \{E[Y|x]\} - \lim_{x \downarrow 0} \{E[Y|x]\}$. Continuity of potential outcomes without this care-assignment contrast gives its causal

meaning. The same quantity for recorded care is an implementation contrast, not an instrument denominator.

This requires the recorded score to match, or preserve assignment around, the score used by clinicians; no selective rounding/reweighing or selective live-birth/contact capture; smooth baseline risk and provider mix; meaningful operation of the recommendation; and no other discontinuous non-care cause. Smooth gestational composition allows a mixture of infants with different competing eligibility. We neither assume all infants receive different care nor divide by the share ≥ 32 weeks. Hospital records reflect surveillance as well as health. These assumptions cannot all be tested.

Because W is discrete and the equality value is omitted, the limit is not non-parametrically point identified from this extract. The analysis reports a finite-window local-linear contrast and a **curvature-conditional interval for the cutoff contrast**. No assertion that weight clustering, jittering or a large number of children repairs discrete support is permitted.

Fixed estimator and explicit uncertainty

The primary estimator uses $0 < |W - 1500| < 200$ g. At $x = -2, +2$ the triangular kernel is zero; include these observations only in audit displays. Set $k_i = \max(0, 1 - |x_i|/2)$. On each side separately regress the endpoint on $(1, x)$ by weighted least squares. The left minus right intercept is $\hat{\alpha} = \sum a_i Y_i$; compute and retain the exact linear weights a . Assert $\sum_{\text{left}} a = 1$, $\sum_{\text{right}} a = -1$ and $\sum_{\text{left}} a x = \sum_{\text{right}} a x = 0$ to numerical tolerance $1e-10$. Use no outcome-selected bandwidth, controls, polynomial order, bins or hospital exclusion. No postnatal covariates enter.

Require two distinct positive-weight scores on each side and full-rank side designs. If not, report observed support and a non-estimable contrast; do not widen the window or report an effect of zero. Report nearest score distances, mass-point counts, effective $N = (\sum |a|)^2 / \sum a^2$ and the largest group's share of $\sum |a|$. These are descriptive support measures, not invented power estimates.

For a bounded endpoint scaled into $[0, 1]$, assume the conditional-mean functions on each side have $|f'(x)| \leq M$ on the full ± 200 g window. Then a conservative Taylor remainder bound is $B(M) = M/2 \times \sum |a_i| x_i^2$. The primary reference is **$M = 0.05$ per(100 g) 2** : at 200 g this permits a remainder of 0.10 in risk from the tangent on either side. This is a disclosed sensitivity assumption, not a clinically validated maximum. Report $M = 0, 0.01, 0.025, 0.05, 0.10, 0.20$, and the continuous M value at which the interval first contains 0 (or 0 if already containing 0, infinity if no slope). $M = 0$ is exact side-linearity, not “no assumptions.” Wider M never narrows the interval.

Use a finite bounded-outcome concentration interval rather than normal standard errors that collapse at zero events. For birth-family groups g from data-contract.md, $b_g = \sum_{i \in g} |a_i|$ and $H_g = \sqrt{\log(2/\alpha)/2 \times \sum_g b_g^2}$. Conditional on the score and independent birth-family groups, Hoeffding's inequality bounds $|\sum a_i (Y_i - E[Y_i | \text{scores}])|$ by H_g with probability at least $1 - \alpha$. Within-group dependence can be arbitrary. The outcome bounds and independence assumption are essential; this is conservative and may be uninformative, especially in small samples.

It is not a package default or a claim that clinical outcomes are independent within hospitals.

For incomplete outcomes $[L_i, U_i]$, form $T_{\text{low}} = \sum_{a \geq 0} aL + \sum_{a < 0} aU$ and $T_{\text{high}} = \sum_{a \geq 0} aU + \sum_{a < 0} aL$. Report the identification envelope $[T_{\text{low}}, T_{\text{high}}]$, not an imputed midpoint estimate. The confidence set is $[T_{\text{low}} - H_- - B(M), T_{\text{high}} + H_+ + B(M)]$ intersected with $[-1, 1]$. With completely known endpoints $T_{\text{low}} = T_{\text{high}} = \hat{\theta}$. This combination remains valid without missing-at-random: the unknown realised weighted sum lies inside the envelope. Do not subtract two fitted lower endpoints without sign-aware weights. Report bounds that span the entire feasible range as uninformative, not as null results.

Repeat H_- using birth-hospital groups connected by any known mothers delivering across hospitals as a **dependence sensitivity**; missing cross-hospital family dependence remains an assumption. Hospital-group intervals may be much wider. Main causal directional language requires the primary family-group set to exclude zero and must disclose if the hospital-group set contains it; the registered local classification is then sensitivity-limited. No ad hoc variance clustering on gram values.

The same formula applies to bounded care-use variables after scaling: inpatient days in 28 days divided by 28 and outpatient days in year1 capped at 20 then divided by 20; rescale estimates/intervals to days. Here $M=0.05$ refers to the scaled outcome and is explicitly labelled. Uncapped outpatient total is a descriptive ledger only, with no registered causal confidence set. No observed-event-count threshold determines the estimator or outcome schedule.

Multiplicity, precision and selection

The confirmatory family comprises exactly three 2013 endpoints: death before 5; any qualifying post-neonatal respiratory admission before 5; completed-contact epilepsy recording before 5. Each uses $\alpha=0.05/3$, hence 98 % marginal confidence sets and at least 95% simultaneous coverage for the three intervals under their assumptions. All three remain in the family even if an Atom is unrun, missing or non-estimable; no alpha recycling. All other endpoints, ages, strata, historical comparisons and specification variants have 95% pointwise intervals and explicitly supplementary status. Neither a new pathway nor a headline is selected by their p-values; no p-values or significance stars are required.

No equivalence margin or clinically minimal effect is justified here. Intervals containing 0 are unresolved in direction, not evidence of absence, safety or equivalence. Report feasible effect magnitudes and the curvature frontier. Ex ante precision cannot be inferred from schema or external cohort counts. After the score roster is built, a design-only interval half-width $H_- + B(M)$ may be reported as attainable sensitivity for a bounded endpoint, without looking at events; no “powered” claim or sample-size expansion follows.

Outcome access begins after cohort/score audit and source interpretation are recorded. All specified estimable outputs are retained, including inconvenient diagnostics. Activation relies on construct availability/assignment contradictions, never care effects or a favourable health result. Diagnostic pretesting does not grant conditional coverage after selecting a favourable baseline; intervals are reported for the

fixed design, with qualifications. If institutional evidence contradicts the assignment or identity cannot support a cohort, report the impediment; an observational cohort is not an authorised replacement.

Ordered validity audit

First audit source applicability and exact score meaning; then key/cardinality and infant identity; then date/weight/coding coverage; then score support; then baseline composition and observation. Only thereafter inspect neonatal care and health. Source contradictions outrank empirical pattern descriptions. An absence of a named field is an evidenced data_gap; absence of an answer about its meaning is unresolved. Timeouts, unavailable credentials and interrupted computation are no_result.

Inspect every gram frequency, including 1500, and 10/50/100 g heaping; compare the 1500 mass to 1400 and 1600 masses as descriptive context, not a density test under a false continuous score. Report histogram and empirical rounding patterns by birth hospital and era. Flag concentration if 50% of the window lies on 50 g multiples, nearest support is >25 g on either side, or a birth-family group carries >20% of $\Sigma|a|$. These transparent diagnostic flags indicate fragility, not proof of manipulation. No jitter.

Baseline variables are sex, gestation days/stratum/unknown, hospital shares, birth month, identified multiplicity/unknown and maternal-link missingness. Report left/right means or proportions and local-linear discontinuities; no adjustment based on their p-values. For bounded composition variables use 95% concentration sets with $M=0.05$. Flag a substantive discontinuity when the interval excludes 0 AND the contrast exceeds 0.10 for sex or missingness indicators, 0.15 for <32-week status, or 0.20 total variation across hospital shares. For exact gestation use days/315 to bound the variable; flag >7 days with a corresponding interval excluding 0. Hospital total variation is $\Sigma|\text{left_share} - \text{right_share}|/2$ and is descriptive; its >0.20 flag needs no p-value. Birth-month and multiplicity distributions are displayed without an additional threshold test. Cutoffs are reviewable diagnostic conventions, not a probability of valid identification. Unknown necessary score/identity facts remain unresolved regardless of balance.

Fixed supplementary variants

1. Bandwidth 100 g and 150 g, otherwise identical main rule and same M grid; insufficient support remains non-estimable.
2. Exclude all observations with $|W - 1500| \geq 25$ g. This wider gap tests local contamination; B(M) still uses actual distances. It cannot repair sorting outside the removed region.
3. Include 1500 and place it on the right (strict rule) and, separately, on the left (weak rule). Neither variant is the main analysis, even if the primary source's equality convention later becomes clearer; changes require an amendment before outcomes.
4. Remove all 50 g multiples. This changes the measured subpopulation; report as recording sensitivity, not a better chosen result. No treatment of sparse surviving support as insignificance.

5. Known <32, known >=32 and unknown gestation strata for the three clinical age 5 endpoints; separate estimates and a known-strata difference using a union-bound difference of 97.5% constituent sets for a 95% difference set (no independence assumed). This is exploratory effect modification, with linked-subset selection limits.
6. The fixed 2010–2011 historical comparison for care and the three age 5 endpoints; descriptive period difference of the two contrasts, using 97.5% constituent sets and a 95% union-bound difference set, not a causal reform estimate. No historical cohort selected by mortality.
7. Endpoint-specific phenotype/observation variants in the native protocols. No other endpoints, cutoffs or controls may be added during transcription/runtime.

Shared output contract

Each realised Atom writes under its own governed evidence directory, not into the pristine template. No person-level file is released. **disposition.json** contains `local_state`, `operational_status`, `reason`, `completed_outputs`, `omitted_outputs` and `claim_ceiling`. **effects.csv** contains `atom_id`, `period`, `stratum`, `endpoint`, `horizon`, `variant`, `bandwidth_g`, `equality_rule`, `unit`, `n_left`, `n_right`, `groups`, `support_left`, `support_right`, `T_low`, `T_high`, `estimate` (nullable unless identified), `ci_low`, `ci_high`, `alpha`, `M`, `bias_bound`, `concentration_radius`, `dependence`, `status`, `reason`. All statistical quantities remain absent if unavailable; zeros are numeric results only.

profile.csv contains `period`, `stratum`, `endpoint`, `weight_g`, `n`, `known_n`, `sum_lower`, `sum_upper`, `mean_lower`, `mean_upper`; these are plot-ready summaries at actual scores, never interpolated observations. **fit.csv** contains `endpoint`, `period`, `stratum`, `variant`, `weight_g`, `side`, `fitted_lower`, `fitted_upper`, `status`; evaluate the registered side fits on a 1 g plotting grid, with any gap represented as extrapolation. Fits are descriptive; no fabricated pointwise uncertainty. **sensitivity.csv** uses the same effects schema. All clinical Atoms additionally write **observation.csv**: `period`, `stratum`, `variant`, `endpoint`, `horizon`, `n_births`, `n_known_event`, `n_known_none`, `n_interval`, `n_dead`, `definition`. Metadata includes source snapshot and code-list hashes, checks and exclusions, without confidential rows in delivery.

For each registered stratum or historical difference, write **contrasts.csv**(`endpoint`, `contrast`, `T_low`, `T_high`, `ci_low`, `ci_high`, `alpha`, `status`, `reason`). Subtract the second upper endpoint from the first lower, and conversely; do not subtract two lower limits. Constituent curvature bounds and concentration radii add. These 95% differences are supplementary, not additional confirmatory hypotheses. Empty feasible intersections receive `model_conflict` and no numerical direction.

Stable variant keys: `primary`, `h100`, `h150`, `donut25`, `equality_right`, `equality_left`, `no50`; endpoint-specific `resp_secondary`, `resp_gap30`, `broader_observation`, `neuro_g40_g41`, `neuro_timing`. Curvature grids use `variant=primary` with distinct `M`; hospital sensitivity uses `dependence=hospital`. Period is the string 2013 or 2010–2011, stratum is `all`, `lt32`, `ge32`, `unknown`; primary endpoint definitions are unchanged in sensitivity outputs.

Final aggregate-interface clarification

At a display-grid value x_0 on a given side, compute prediction weights $q(x_0) = (1, x_0)(X'KX)^{-1}X'K$ using that side's **registered** fit and its fixed observations. With interval outcomes the fitted lower envelope is $\sum(q \geq 0 \text{ } qL) + \sum(q < 0 \text{ } qU)$, and the upper envelope reverses L/U. Separate regressions of all L and all U are not the envelopes: prediction weights can be negative. The 1 g grid is drawing support, not new observed weights or new estimates. The envelopes are descriptive fitted completions, not confidence sets; do not attach sampling coverage, clip fitted lines into the outcome range, or fill the score gap with observations. Distinguish interpolation within observed side support from extrapolation beyond it.

Every plot-ready table carries, directly or in its bound metadata, the end-point unit, period, stratum, variant, bandwidth_g and equality_rule. Existing `effects.csv/sensitivity.csv` rows also carry alpha, M and dependence. Primary machine conventions remain unit=risk for binary endpoints (renderer multiplies by 100 for percentage points), unit=days for already rescaled care-day effects, bandwidth_g=200 and equality_rule=omit. Primary family or hospital age-five sets use alpha=0.05/3; supplementary horizons use alpha=0.05. Profiles and fits have no confidence-level claim. A legacy input adapter may attach metadata only when its provenance unambiguously supplies it, never by guessing from a filename.

The horizon field and its companion horizon_unit make the clock explicit: death28/photo28/inpatient_days28 use 28,days; photo14 uses 14,days; death1/resp1/neuro_epilepsy1 and outpatient year-one measures use 1,birthday_years; analogous ages 3 and 5 use 3 or 5,birthday_years. This metadata clarifies existing clocks; the birthday and half-open-window rules remain authoritative. Figure 5 positions the day-28 death horizon at 28/365.25 on a display-only age-in-years axis, labels it “28 days,” and uses 1,3,5 at the exact birthday labels. No date comparison or endpoint is computed from that display conversion.

Renderers validate metadata before scaling/drawing, reject duplicate or scientifically mismatched rows (including wrong unit, alpha, bandwidth or equality convention), and preserve absent/unresolved rows with reasons. Identification envelopes are drawn as ranges, without a midpoint estimate. Missing or suppressed time points break any guide connector. Numerical signs, differences between two ages and between-domain differences are not inferred from plots as new tests. The full registered outputs, including uninformative and unavailable comparisons, remain reportable.

Curvature-frontier output (existing reporting commitment)

Carry `curvature_zero_M` with each reference effects row (nullable if the contrast/support is unresolved). This is the already required first M 0 for which zero enters the set, not a new comparison. Write $C = \Sigma |a| x^2 / 2$ and $R = \max(T_{\text{low}} - H, -T_{\text{high}} - H, 0)$. The frontier is R/C when $C > 0$; when $C = 0$ it is 0 if $R = 0$ and positive infinity otherwise. Represent infinity explicitly in metadata, never as an unavailable value. The calculation uses the reference row's endpoint scaling, missing-outcome envelope, alpha and dependence. Do not derive the continuous frontier by interpolating plotted M-grid rows. The main result/conclusion bindings

must carry this number and its assumption meaning; detailed values belong with the SI curvature display. This completion of an existing output obligation changes no interval, primary family or local state.

Registered protocol appendices

The preceding protocol and statistical analysis plan are the reader-facing explanation. The exact Atom protocols, local result rules, and Molecule registration below retain the executable scientific authority.

Graph overview

Dependency edges summarize the graph, not unconditional activation. Exact logical conditions and all local outcomes follow below; the separate graph atlas shows each Atom's branches.

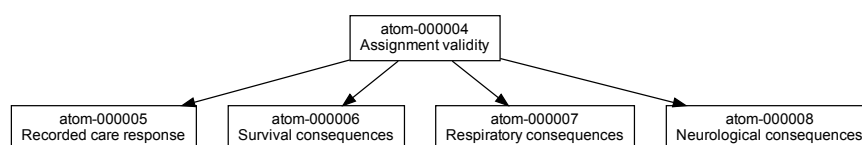


Fig. 1 Registered Atom dependencies

Literature and documentation

Source history: the retained entries below record the supplied scientific baseline's access on 8 September 2026 America/Chicago (9 September UTC). Current Blueprint verification is identified separately below and in search-log.md; inherited full-text access is not claimed as new independent reading. No published result was imported into this study.

daysal2022

Daysal et al. (2022). Spillover Effects of Early-Life Medical Interventions. The Review of Economics and Statistics. [Source](#).

Full author manuscript, 33 pages: physical pp.1–16 consulted, especially 6fn3, 7, 10fn10, 12–15. Published record checked; this is not a new-data availability source.

dps2012

Danish Paediatric Society (25 January 2012). Behandlingsstandard for neonatal hyperbilirubinæmi. [Source](#).

All 6 pages read; Figure 2/p4 rendered and visually inspected. Original equality ambiguity retained. Source chart uses $\mu\text{mol/L}$, confirmed visually despite extraction error.

sun2023

Sun et al. (2023). Neonatal Phototherapy and Clinical Characteristics: The Danish National Patient Registry 2000–2016. Clinical Epidemiology 15:123–136. [Source](#).

PMC9884443 fulltext successfully retrieved through NCBI BioC; Methods, registration and guideline discussion consulted. External reporting study, not validation of our extract.

sun2024

Sun et al. (2024). Neonatal phototherapy and risk of epilepsy—A Danish population based study. European Journal of Pediatrics 183:4111ff. [Source](#).

PMC11322204 fulltext BioC; cohort, phototherapy and epilepsy definitions consulted. Its ≥ 35 -week neonatal-survivor design and laboratory source are not imported.

infection2025

Associations between multiple perinatal exposures and risk of childhood hospitalisation with infection: a registry-based study in two countries (2025). European Journal of Epidemiology 40:1231ff. [Source](#).

PMC12660341 fulltext BioC; cohort, exclusion, seven-day recurrence and under-five analysis Methods consulted. Overlaps timing/recurrence; no novelty claim based on those alone.

faelles2010

Sundhedsstyrelsen. Fællesindhold2010. [Source](#).

313-page official PDF; physical 29,47–48,56,60,150–151,154,159–160 read; delivery gestation on maternal diagnosis, infant contact requirements. Front/earlier chapters not exhaustively read.

faelles2014

Sundhedsdatastyrelsen. Fællesindhold2014-2, vejledningsdel,23rdedition. [Source](#).

171-page PDF; cover and physical 17,30–31,33,37–38,103–104,109–113 read. Search-engine title mislabelled2010; source cover establishes version.

bharadwaj2013

Bharadwaj, Løken and Neilson (2013). Early Life Health Interventions and Academic Achievement. AER 103(5):1862–1891. [Source](#).

Author-hosted finalPDF physical 18/footnote20 and reference page30 read. The later-period caution is about Chile/Norway; no Danish zero-assignment inference.

barreca2011

Barreca, Guldi, Lindo and Waddell (2011). Saving Babies? Revisiting the Effect of Very Low Birth Weight Classification. QJE126:2117–2123. [Source](#).

Seven-page finalPDF opened; physical 1–5 text, particularly3–4, consulted. Heaping may be composition-related; a donut is not proof of valid assignment.

kolesar2018

Kolesár and Rothe (2018). Inference in Regression Discontinuity Designs with a Discrete Running Variable. AER 108:2277–2304. [Source](#).

Official AEA abstract and supplement introduction consulted. Supports rejecting gram-cluster standard errors as misspecification protection. Our conservative linear-weight/Taylor/concentration bound is explicitly derived in the SAP, not attributed as an exact implementation of this paper.

seppanen2024

Seppänen et al. (2024; online17 November 2023). Variation in follow-up for children born very preterm in Europe. European Journal of Public Health34:91–100. [Source](#).

Full publisher text, Methods and policy chronology/Table 1 consulted. Danish local programmes before 2022, not proven universal1500 g follow-up in 2013.

hansen2020

Behandling og opfølgning af tidligt fødte børn i Danmark (30 March 2020). Ugeskrift for Læger. [Source](#).

Full web text, care course and local follow-up passages read; retrospective clinical context, not a dated2013 uniform rule.

dps2014

Danish Paediatric Society (1 January 2014). Enteral ernæring til præmature. [Source](#).

All6pages read; gestation and other weight criteria do not document a 1500 g assignment for the proposed2013 cohort.

hviid2007

Hviid and Melbye (2007). The Impact of Birth Weight on Infectious Disease Hospitalization in Childhood. *AJE*. [Source](#).

Historical abstract-level positioning reused; not independently fulltext-verified in this author stage.

sun2008

Sun et al. (2008; online2007). Gestational age, birth weight, intrauterine growth, and the risk of epilepsy. *AJE*. [Source](#).

PMC2632964 metadata found. BioC HTTP200 returned an HTML service response rather than article JSON; no fulltext upgrade. The new2024 fulltext supports the code comparison.

jensen2020

Jensen et al. (2020). The match between need and use of health services among healthy under-fives in Denmark. *PLOS ONE*. [Source](#).

PMC7161958 metadata and historical source discussion; not a new fulltext verification. Does not justify a healthy-survivor entry rule here.

garcia2021

García-Mirallés and Leganza (27 August 2021). Public Pensions and Private Savings. CEBI working paper06/21. [Source](#).

Local 65-page exemplar, despite2024filename. Selected scientific sections and appendix consulted; exact coverage in paper/coverage.md. Not the final journal version.

mikkelsen2026

Mikkelsen et al. (2026). Menopausal hormone therapy and long term mortality: nationwide, register based cohort study. *BMJ* 392:e085998. [Source](#).

Local final10-page exemplar; main prose, clinical methods and selectedtables consulted; Figure 1/p4 rendered. Separately hosted supplement not read.

Prior-art assessment and theory

The contribution is a transparent prospective examination of a later Danish clinical recommendation threshold, with an explicitly bounded recording environment. It is not the first study of neonatal thresholds, child health by age five, respiratory recurrence, or phototherapy and epilepsy. The closest Danish threshold precedent supplies

ITT reasoning; the later phototherapy literature supplies a specific rule and a measurement warning. The link from a recommendation to subsequent health remains scientifically useful because treatment changes may alter survival, disease and the probability that disease is recorded.

Biological vulnerability need not jump at exactly 1500 g, while clinical decision rules can. Better early care could improve survival and reduce later complications, but it could also increase the number of children surviving long enough to be admitted or diagnosed. Monitoring can change hospital recording without changing latent disease. These rival explanations motivate the survival, joint-endpoint and care-use sequence. No direction or effect magnitude is assumed. Family-income complements are plausible but do not supply exogenous assignment here; the previous income grouping is not retained as a central target.

Local search and authenticated OpenAlex identify related work and citations; titles/abstracts alone do not establish detailed methods. The verified2012 guideline, rather than prestige or a novelty score, supplies the present clinical assignment rationale. A future documented contradiction must constrain the claim even if the graph and manuscript are complete.

Current Blueprint source verification

The current stage independently re-read the original DPS2012 pp.3–5 and visually inspected Figure 2/p4; the 33-page Daysal author manuscript pp.6–7 in context; and Fællesindhold2014-2 pp.33/38 for optional acute outpatient visit dates. These clarify recommendation/receipt and recording, not runtime adherence or data availability. The raw documents remain internal, with public source links above. Selected exemplar passages and rendered pages are listed in docs/story/blueprint.md; inherited coverage is not conflated with these new readings.

Deschmann et al. (2026). Phototherapy, Morbidity, and Mortality in Very Preterm Newborns. JAMA Network Open 9(5):e2614107, published 21 May 2026. DOI; PMC full text. Authenticated OpenAlex exact DOI resolution and publisher metadata verified identity; PMC BioC supplied readable full Methods after the PMC browser page challenged access. The Methods describe Swedish neonatal care in November2015–December2024, first-week phototherapy duration, exclusion of first-week deaths, and subsequent neonatal outcomes with measured-covariate adjustment. This is a different exposure, survivor population and clock from all-birth Danish eligibility through five. It motivates separating indication, survival and recorded morbidity; it supplies no expected Danish sign, treatment-dose measurement or isolated phototherapy effect. The source entered current knowledge through the upstream handoff; this full-methods verification belongs to Blueprint.

Jensen and Zhang (2026). Effects of Parental Death on Labor Market Outcomes. Final AER116(5):1811–1836, DOI, local26-page version only. **Kleven, Landais and Sogaard (2019).** Children and Gender Inequality: Evidence from Denmark. AEJ Applied11(4):181–209, DOI. These source passages/figures inform measurement alternatives and time-axis comparisons; they do not supply this cohort's fields, mechanisms or identification. No external supplement or Parental Death working-paper version was consulted.

Shared data contract

This document is incorporated in each native Atom protocol. It is a specification for governed runtime validation, not a report that tables have been delivered. Only the user-listed 47 tables are authorised; this study uses the seven active tables listed below (plus one explicitly unused inherited source). The full unchanged boundary is preserved in data-boundary.yaml.

Exact fields and historical semantics

Table	Required fields and purpose	Documentation / uncertainty
LPR_FOEDSLER	RECNUM; V_VAGT (birthweight, grams); V_FLERNR (child order A–F); VERSION, LEVERANCEDATO	FSV table page, 1995–March 2019. Verify row unit and infant contact attachment; child order A alone does not establish singleton status. D_SMENDTO is not used as gestation.
LPR_ADM	RECNUM, PNR, D_INDDTO, D_UDDTO, V_ALDDG, C_HENM, C_PATTYPE, C_INDM, C_SGH, C_AFD, C_SEX, VERSION, LEVERANCEDATO	Contact key; V_ALDDG is age in days at contact start, documented from 2001. Do not treat admission time on the mother’s record as birth time.
LPR_DIAG	RECNUM, C_DIAG, C_DIAGTYPE, C_TILDIAG, VERSION, LEVERANCEDATO	One-to-many diagnoses per contact; additional gestation codes must be attached to the mother’s delivery action diagnosis.
LPR_BES	RECNUM, D_AMBDTO, VERSION, LEVERANCEDATO	Actual outpatient visit dates, not an assumed daily visit over an open contact.
LPR_SKSUBE	RECNUM, C_OPR, D_ODTO, C_TILOPR, VERSION, LEVERANCEDATO	BNGC/BNGC0 are recorded phototherapy, with incomplete reporting. No assertion of a complete receipt register.

Table	Required fields and purpose	Documentation / uncertainty
BEF	PNR, FOED_DAG, MOR_ID, FAR_ID, KOEN, REFERENCEID	Resident snapshots: link and corroborate; not a prerequisite for birth-cohort entry, not exact migration dates.
DODSAASG	PNR, D_DODSDATO	Catalogued 2002–2022; field listing uses 2022. Establish whether the supplied file is cumulative and contains earlier neonatal deaths. No assumed annual panel.
IND	PNR, PERINDKIALT_13, source-year metadata	Not requested for analysis in this baseline. Its historical income definitions are reusable provenance only; no new income subgroup is registered.

The active Atom table lists omit IND. Other allowed tables are unnecessary. Schooling, prescriptions, bilirubin laboratories, specialist cerebral-palsy records and LPR3 are not authorised. SSSY has ambiguous child attribution and limited dates in the candidate era; it is not substituted for hospital outpatient visits. BOERNFB cannot establish parentage or schooling attainment.

Authoritative birth-registration guidance: Fællesindhold **2010**, physical pp.150–151 and 160 (printed 146–147, 156), and **2014-2**, physical pp.109–113. The 2010 text requires delivery gestation as DUnnDu on DO80–DO84; the 2014 guide separates maternal and infant contacts and explicitly covers infants showing signs of life. Births may be outpatient in 2013. Sources are indexed in sources/literature.md. These describe reporting requirements, not their realised compliance.

Version, key and join rules

1. Read only approved runtime extracts. Require a provider manifest giving table periods, field types, encryption domain, snapshot/vintage, contact unit, recording coverage and version semantics. Missing documentation is unresolved; demonstrated absent required fields/periods is a data gap. A failed call is no_result.
2. Preserve raw code strings and leading zeros. Strip whitespace; no conversion of encrypted PNR to numbers. Do not strip the Danish D prefix from diagnosis codes. Date parsing must fail on invalid nonmissing values. Use the source’s documented missing sentinels, never replace them with zero.

3. Distinguish event dates from VERSION and LEVERANCEDATO. If version semantics are unavailable, do not arbitrarily select the latest row. Exact identical rows may be collapsed with an audit. Resolve versioned rows as of the fixed extract vintage under documented rules. Conflicting simultaneous versions block the affected construct.
4. Require one resolved ADM row per RECNUM and a single PNR per contact. Verify that the actual RECNUM namespace is global within LPR; if documented compound keys are needed, apply the same key to every join, otherwise stop. FOEDSLER: many records to one ADM; inspect the birth/contact unit before reducing. Do not join diagnosis rows to procedure or visit rows and multiply observations. Reduce each source to its prespecified contact flag or dates first. DIAG/BES/SKSUBE each join many-to-one to ADM with orphan counts and reasons. No orphan in an analysed contact is silently discarded.
5. BEF: one resolved PNR×REFERENCETID row, with exact duplicates collapsed. Parent identifiers may be absent. Distinct reported birth dates/parent IDs are not resolved by majority vote. Mother links corroborated across snapshots are ancillary; no requirement to observe a particular snapshot. DODSAASG: at most one consistent death date per resolved PNR. Duplicate equal death dates collapse; conflicting or prebirth dates yield unresolved outcome/identity and an audit.
6. Temporary/permanent infant PNR mapping must be documented within the supplied encryption/linkage service for the **allowed** tables. No new link table or guessed CPR reconstruction is authorised. If rekeying cannot be reconciled, retain affected identifiable birth units with interval outcomes where possible. If birth units themselves cannot be deduplicated, the central cohort is unresolved; do not delete infants until counts look plausible.

Infant-first cohort and time zero

Candidate years are fixed: primary **2013**; historical comparison **2010–2011**. Extract birth contacts plus all necessary follow-up records through 31 December 2018. Full five-year windows end before the legacy transition; no LPR3 bridge or survival-to-completion criterion is used.

Find infant ADM contacts carrying date-valid hospital-livebirth action codes DZ380, DZ383 or DZ386 (and only source-valid hospital-born descendants) and C_HENM=8 (born here), after verifying these historical roles from the guide and provider mapping. Identify D_INDDTO as birth date only on such an infant birth contact, with V_ALDDG=0 or corroboration by consistent FOED_DAG. A transfer admission is not a new birth. Retain both inpatient and outpatient delivery contacts. Stillbirths, home/en-route births and non-birth maternal records are outside the target, with separate flow reasons. A questionable liveborn status is unresolved, not an inferred stillbirth.

Attach FOEDSLER weight through the validated infant contact. Require a positive integer gram value under the documented coding. Do not divide by 10, impute from diagnoses, use 2500 g categories, or round to force a score. Conflicting weights across the same birth event are unresolved; audit them without choosing the estimate that strengthens assignment. Retain the complete birth-contact audit, then the

prespecified 1300–1700 g roster inclusive. At the main fit’s endpoints kernel weights are zero. Exactly 1500 is retained in audits but excluded from the primary fit. The missing-weight proportion is reported over all identified hospital births; its unobserved distribution around 1500 cannot be learned by deleting it.

The target includes **singletons and multiples**. Child-order A is not a singleton indicator. Multiples are not different experiments and are not discarded for absent maternal linkage. One infant is the outcome unit. Cluster linked children by mother; for infants without a consistent mother link, use birth-hospital×birth-date groups. Use transitive closure so a shared delivery group is not split by partial mother linkage. Independence across these birth-family groups is an explicit sampling assumption. A separate birth-hospital clustering sensitivity assesses shared clinical shocks.

Birth=day 0. Neonatal windows are [birth,birth+14 days) for weight-rule recorded phototherapy, [birth,birth+28 days) for hospital days/expanded phototherapy. Integer age days and calendar birthdays are distinguished. An age-h endpoint includes dates strictly before the h-th birthday; 29 February birthdays map to 28 February in non-leap years. Date-only death on an event date permits that event; no within-day order is claimed. Entry never requires being alive, discharged, resident in BEF, or observed at the endpoint.

Gestation: a secondary stratification, not an entry condition

Local dated SKS files document DUwwDd, including DU31D6 and DU32D0, during 1997–2015. On a mother’s action DO80–DO84 diagnosis, C_TILDIAG can carry completed weeks plus days **at delivery**, per the 2010 and 2014 guides. Link mother PNR using BEF.MOR_ID only if consistent; select delivery contacts overlapping the infant birth date or closing within two days after it, and require an unambiguous same delivery. Do not select an unrelated antenatal gestation code. Two conflicting qualifying gestation values make gestation unknown; no nearest-code tie breaker.

Exact DUwwDd with d=0..6 gives 7×ww+d days. DUwwDX, unknown-day codes or DU99DX do not give exact days; their documented interval can classify <32 or ≥32 only if wholly on one side of 224 days. For the ancillary plausibility guard, accept a gestation interval only if entirely within 140–315 days (20–45 weeks); values outside this deliberately broad predeclared range, invalid-date codes and unsupported coding stay unknown. This is a measurement guard, not a livebirth viability rule or an exclusion from the primary cohort. DP072/DP073 do not supply week-level age and absence of these diagnoses does not mean ≥32. D_SMENDTO is unused. Compare documented-coded gestation distributions and missingness by score, hospital and era; no assumed availability or completeness.

Primary analysis remains all gestations regardless of this result. Prespecified supplementary contrasts in known <32, known ≥32 and unknown gestation describe those observed subsets; they are not a reconstruction of Daysal’s population and cannot establish a population-wide gestation interaction without a selection assumption. Unknown is a retained category. Sex uses concordant C_SEX/KOEN under their documented mapping; conflicting/missing values remain unknown.

Follow-up and missingness

The primary hospital outcomes are **Danish public somatic hospital-recorded events**, not all illness occurring anywhere. Complete, linkable LPR coverage with no qualifying event licenses zero for this recording target, even if residence abroad is possible. It does not license “healthy.” For clinical interpretation beyond recording, assume no discontinuity in emigration, private care substitution or ascertainment; BEF snapshot presence and observed follow-up contacts probe this, but cannot prove continuous residence.

A known event settles an ever-event endpoint at 1. If records are missing for any eligible period or an infant’s PNR cannot be followed, set[0,1] unless death or a known event settles the endpoint. Complete follow-up is an outcome property, never an entry filter. Death before day 28 fixes post-neonatal respiratory occurrence at 0. For mortality, death before the horizon gives1; documented life at/after the horizon gives0. Otherwise absence from a death file is zero only if its documentation establishes complete vital-status ascertainment for that child and interval; if not, [0,1]. A later resident snapshot can supply evidence of life without selecting cohort entry. Known death after the horizon also proves survival to the horizon.

Primary hospital recording estimates and an additional observation sensitivity are separate: for the latter, treat intervals lacking affirmative residence evidence as potentially missing illness, set unresolved ever-events to[0,1], and label the result an intentionally conservative bound on a broader health interpretation. Annual snapshots do not fill exact migration gaps. Do not fit an inverse-probability censoring model without validated migration dates or invoke missing-at-random by default.

Verified administrative values and calendar changes

The official2010 guide, physical 29,47–48,56 and 60, documents C_HENM=8 born here, inpatient patient type 0, outpatient type 2, emergency-department type 3, and admission model acute/2 planned. The 2014-2 guide, physical 30–31,33,37–38, confirms inpatient0/outpatient2 and replaces the former emergency type with acute outpatient contacts from 2014. No bare patient-type 1 inpatient assumption is carried over. Require the supplied FSV coding to match these raw administrative values or a documented meaning-preserving recode; an unknown recode is unresolved.

The complete infant candidate audit can start from DZ38*, but target hospital births require DZ380/DZ383/DZ386 and source-valid descendants. DZ381/384/387 (including home/en-route descendants) are outside setting; DZ382/385/388 or unspecified DZ38 leave birthplace unresolved rather than assumed hospital. Their date-valid labels were inspected for2010–2013. C_HENM=8 alone does not distinguish birthplace because even home-born infants can have a birth report.

Outpatient visit-days retain the actual type 2 definition in each year. From 2014 it can include contacts formerly classified as emergency-department type 3, so it is not a harmonised preventive-care measure. This calendar change also qualifies historical neurological comparisons. All infants in the primary2013 birth cohort cross the same calendar change, but smooth case composition remains necessary. No causal before/after reform contrast is claimed.

When contact timing is interval-valued, define a binary endpoint’s lower value as its minimum and upper value as its maximum over all calendar-date completions consistent with the known contact dates, event ordering, birth/death bounds and the registered spell/episode rules. A qualifying occurrence is known only if it occurs in every such completion. For recurrence, two recorded contacts establish two episodes only if the separation exceeds the registered gap in every feasible completion; otherwise use interval bounds. Enumerating feasible dates is the reference pseudocode; a meaning-equivalent dynamic implementation is permitted. If constraints conflict, report unresolved rather than an empty patient history. No arbitrary discharge-date imputation is allowed.

Outpatient ascertainment across 2014

The official 2014-2 guide explicitly makes reporting the visit date optional for acute outpatient contacts (physical pp.33 and 38). A completed acute contact with a valid diagnosis can therefore have no LPR_BES row even in a complete delivered file. The primary outpatient care count is **BES-recorded visit-days**, not all outpatient attendance. Primary neurological recording requires completion and BES support for an outpatient contact; absence of that support is absence of the narrower registered recording predicate, not proof of no diagnosis or illness.

The already registered `neuro_timing` sensitivity considers every qualifying diagnosis-bearing contact, including a completed acute outpatient contact without BES. A valid completed contact wholly before the horizon establishes recording by that horizon for this sensitivity. A contact straddling the horizon yields possible timing rather than a backdated diagnosis. This comparison changes both attendance support and timing ascertainment; its difference from the primary cannot be attributed solely to diagnostic delay. It is not a newly broadened primary phenotype. A truly missing BES delivery remains a coverage problem under the registered interval rules, distinct from an optional unreported visit on an otherwise complete file.

Institutional evidence and identifying contrast

Three different findings

Contradicted route. The original Danish threshold study’s 1982–1993 birth cohort cannot be reconstructed from an LPR_FOEDSLER series documented from 1995. Moreover, an unchanged 1,500 g *phototherapy* threshold cannot be projected back through 2010–2011: the older Danish rule described a continuous weight-based bilirubin criterion. Neither finding proves that every other neonatal care contrast disappeared.

Unresolved facts. The 2012 original chart labels adjacent bands “1000–1500” and “1500–2500”; exact equality is not resolved by its prose. Hospital-level implementation dates, clinicians’ exceptions, the score actually used at the bedside, actual extract completeness and linkage of temporary infant identifiers remain to be assessed. Later national follow-up recommendations cannot be backdated. Missing receipt data do not settle whether assignment matters.

Defensible conditional design. The Danish Paediatric Society’s 25 January 2012 guideline supplies a dated, clinically operative birthweight schedule: immediately below versus above 1,500 g, different bilirubin action thresholds apply. Births in 2013 are compared under that recommendation, allowing a full transition calendar year and five birthdays before the end of legacy LPR. Identification requires that this recommendation influenced practice in the target setting and that biological risk, recording and other determinants would otherwise vary smoothly through the score. These are assumptions supported by the dated rule, not conclusions from a fitted discontinuity.

What is assigned

The assignment is to the **lower-weight care-recommendation schedule**, $Z=1(W<1500)$, versus the higher-weight schedule. At exactly 1500 g the main analysis does not assign Z ; that record remains in the cohort audit and equality sensitivities. The intervention is an encouragement/eligibility policy bundle: thresholds for action, associated monitoring, labelling and referral, and any other care changing at this boundary. It is not compulsory phototherapy for every infant. No bilirubin concentration, dose, wavelength or treatment indication is observed within the authorised boundary.

DPS2012, pp.3–5 and Figure 2, concerns newborns, uses birthweight pragmatically rather than requiring a gestation restriction, and allows individual assessment and modified thresholds for severe illness or isoimmunisation. Its weight rule changes to current weight after two weeks. The 34–36-week curve is for infants over 2,500 g, outside this analysis window. The figure’s inspected plateau near this study’s cutoff is 200 versus 250 $\mu\text{mol/L}$ after day three. These facts justify the primary all-gestation target and the 0–13-day recorded-phototherapy measure. They do not justify reconstructing bilirubin eligibility or excluding diagnosed illness after birth. [Original six-page guideline](#).

Sun et al. (2023) describes application of the 2012 guideline and incomplete, hospital-dependent phototherapy reporting in the same legacy era. Its full Methods identifies BNGC and BNGC0. The paper is external measurement evidence; its sample sizes and reporting rates are not properties of this extract. Its narrative also differs from the original figure outside the present weight range, reinforcing the priority of the original clinical document. [Full text](#).

Relationship to the original Danish threshold study

Daysal et al. (2022), 33-page author manuscript, physical pp.6–7, explicitly permits an ITT interpretation without observing specific early-life treatments (p.6, footnote 3). The reported institutional VLBW definition is strictly below 1500 g; concurrent very-premature eligibility motivates its ≥ 32 -week subgroup. That paper supplies a design precedent, not verified applicability of its historical care package to 2013. Its childhood outcomes also preclude claiming that studying early health is itself novel. [Author version](#), [published record](#).

The reference to less-binding recent rules leads to Bharadwaj, Løken and Neilson (2013), footnote 20, physical p.18: the discussion concerns Chile and Norway, not a demonstration of zero Danish assignment relevance in later years. [Author-hosted final article](#). Absence of detectable mortality effects in another setting is neither a treatment first stage nor evidence of abolished Danish rules.

Competing institutions, timing and interpretation

The 2014 enteral-nutrition guideline is organised chiefly around gestation and other weight bands. The December 2015 resuscitation guideline and 2022 national follow-up guidance are too late to motivate 2013 assignment. A European policy study reports local Danish follow-up programmes before 2022; it does not establish their common 1,500 g rule in 2013. [DPS nutrition 2014](#); [Seppänen et al.](#). These limitations rule out calling the present intervention a uniform national two-year follow-up programme.

Any other contemporaneous intervention truly triggered at 1500 g belongs to the total care bundle. A different *non-care* discontinuity, hospital sorting, selective weighing or differential identity capture threatens the interpretation and cannot be adjusted away. Severe illness, bilirubin tests, treatment, neonatal diagnoses and survival are consequences or clinical decision variables, not baseline controls. Birth timing may respond to anticipated fetal weight; exact postnatal weight is not assumed unmanipulable. No density or covariate test proves otherwise.

The fixed 2010–2011 comparison is a contextual contrast under the earlier phototherapy rule, not a no-treatment placebo: other VLBW care could already operate. Differences between the two periods may reflect evolving care, measurement, hospital composition or background discontinuities. No difference-in-discontinuities causal effect is registered. Selection of period, hospital, subgroup, bandwidth or outcome by a favourable coefficient or first-stage p-value is forbidden.

Scope, execution and reporting

Only schema, public documentation and published literature were read for this scientific handoff. Research participants, governance approvals and access credentials are not asserted. Future analysis requires the relevant governed register environment and its disclosure controls. No private records, outcome summaries, QGPU jobs, external messages, commits or releases are part of this task.

Native registrations remain prospective. A runtime result includes the realised evidence and matched local state; operational failure is separately `no_result`. An unsupported route is neither a null nor successful completion of the quasi-experimental objective. All prespecified primary analyses retain their multiplicity allocation when an endpoint is unavailable.

This Blueprint finalizes the scientific handoff with synchronized native registrations, shared protocols and evidence bindings. Scientific amendments and knowledge history are disclosed; earlier review does not approve this revision. Unknown scientific facts retain the registered dispositions. A later scientific change requires explicit timestamped deviation and knowledge disclosure, not a silent engineering default. The Transcriber implements that final science without changing targets, grouping

or decision rules, and supplies tested reference implementations, labelled hypothetical previews, combined main+SI manuscript and separate protocol/SAP PDFs. No additional scientific writing debate is required.

Keep only current science and concise provenance in the delivered World. Raw PDFs, synthetic data, controller state, old drafts, review verdicts and build/QA logs remain outside distribution. Failed or unavailable figures/tables show their actual disposition, never a preview or invented zero as an empirical fallback. Public counts/estimates must pass the governed disclosure process; suppression reasons are visible, and suppressed cells must not be reconstructable from totals.

Execution supplement

Reference experiments and governed execution

The five runnable entries below implement the final native protocols: infant extraction and diagnostics; clinical outcome construction; signed interval estimation; the registered variants and differences; aggregate output; and activation-aware or explicit direct dispatch. Shared modules contain the actual analyses. The entries are deliberately thin, not unimplemented experiment stubs. Scientific authority remains the five Atom registrations and their incorporated [data contract](#) and [statistical specification](#).

Atom	Numbered source	Output family
000004	Assignment	Cohort and validity audit
000005	Care	Care amounts and contrasts
000006	Survival	Death horizons and contrasts
000007	Respiratory	Admission, recurrence, joint states
000008	Neurological	Diagnoses, timing, joint states

The experiment source numbers are separate from the figure-template numbers. The full identifiers are atom-000004 through atom-000008; the table abbreviates only their printed labels. Python 3.10 or later and NumPy are required. No source is read at import. Raw identifiers and dates stay inside the governed process; only registered aggregates and nonidentifying provenance are written.

Exact entry points

Run these commands from the World root during an authorized governed execution, or substitute the copied code path in a D3 revision. All named paths are supplied by the operator; `provider.json` is a documented extract manifest, not a bundled synthetic dataset. `predecessors.json` contains realized predecessor dispositions. The output and documentation paths must be outside the immutable World.

```
python -B docs/execution/code/01-assignment-template.py \
  --manifest /governed/data/provider.json --world /readonly/world_model \
  --output /governed/data/outputs/assignment --docs /governed/docs
```

```
python -B docs/execution/code/02-care-template.py \
--manifest /governed/data/provider.json --world /readonly/world_model \
--predecessors /governed/data/predecessors.json \
--output /governed/data/outputs/care --docs /governed/docs

python -B docs/execution/code/03-survival-template.py \
--manifest /governed/data/provider.json --world /readonly/world_model \
--predecessors /governed/data/predecessors.json \
--output /governed/data/outputs/survival --docs /governed/docs

python -B docs/execution/code/04-respiratory-template.py \
--manifest /governed/data/provider.json --world /readonly/world_model \
--predecessors /governed/data/predecessors.json \
--output /governed/data/outputs/respiratory --docs /governed/docs

python -B docs/execution/code/05-neurological-template.py \
--manifest /governed/data/provider.json --world /readonly/world_model \
--predecessors /governed/data/predecessors.json \
--output /governed/data/outputs/neurological --docs /governed/docs
```

The equivalent callable is `experiments.execute(atom, inputs, output, docs, world=..., predecessors=..., direct_dispatch=False, max_completions=None)`, where `inputs` is `runtime_inputs.Inputs.load(manifest_path)`. The function returns the same dictionary written to `disposition.json`. `clinical.ClinicalSources.endpoint` is the per-infant internal extractor; it is not an alternative public experiment or an authorization to export person-level evidence.

Default standalone execution respects the native activation. Unknown predecessor evidence is blocked, a realized false trigger is inactive, and a failed predecessor is not a scientific completion. `--direct-dispatch` explicitly bypasses only this outer scheduling check. It still recomputes and seals assignment/cohort diagnostics; a contradiction or unidentified cohort cannot become an estimate. No predecessor result is invented. Every invocation records policy and trigger trace.

`--output` and `--docs` may instead come from `BOLERO_OUTPUT_DIR` and `BOLERO_DOCS_DIR`. Copy the analysis sources to `D3 code/analyses/`; supply that revision's writable data and documentation paths. Neither command changes native nodes or writes into the template. Each invocation replaces only its declared output files and its Atom-specific documentation records. Use distinct governed run directories when retaining multiple invocations.

Inputs, implementations and output mapping

[Runtime input contract](#) defines the strict CSV/JSON adapter, version handling, documentary assertions, coverage intervals and unresolved facts. The seven active source tables are the complete source allowlist for this study. No path, code recode, availability, version order or continuous residence is guessed.

Atom 000004 uses ADM, FOEDSLER, DIAG and BEF plus the provider manifest and dated code dictionary. `cohort.build_cohort` constructs infant births and ancillary measurements; `cohort.assignment_outputs` implements score, support and baseline diagnostics. It writes `cohort-flow.csv`, `score.csv`, `baseline.csv`,

`balance.csv`, `support.csv`, and `institution.csv`. Registered hospital/era heap-ing diagnostics are in `heaping.csv` and `score-hospital.csv`; the latter preserves separate hospital rows without creating duplicates in the Figure 2 score interface.

Atom 000005 adds SKSUBE, BES and DODSAASG lifespan evidence. The `photo`, `inpatient_days`, and `outpatient_days` methods in `clinical.py` implement distinct recorded-care definitions. In addition to shared outputs it writes `hospital-care.csv` and `care-descriptive.csv`. The uncapped outpatient count has side means only and a descriptive status row, with no inferential contrast.

Atom 000006 uses DODSAASG and BEF evidence through `ClinicalSources.mortality`. It writes the shared outputs and `survival.csv`. Child-level cumulative bounds are checked for monotonicity; birth-day deaths and absent resident snapshots remain in the denominator. Conflicting death dates are neither averaged nor interpreted as survival. The clinical extractors share date evidence without depending on the success or direction of this Atom's statistical estimate.

Atom 000007 uses ADM and DIAG with DODSAASG/BEF lifespan evidence. `ClinicalSources.respiratory` unions inpatient components and transfers, preserves same-contact diagnosis/acute conjunctions, excludes birth-continuing spells and constructs recurrence over feasible contact-date completions. It writes the shared outputs and `joint.csv`; the exclusion-count audit is recorded in governed docs.

Atom 000008 uses ADM, DIAG, BES and DODSAASG/BEF. `ClinicalSources.neurological` implements completed-contact DG40/DG80 recording, BES support, DG40-or-DG41 and diagnosis-timing comparisons. Complete acute outpatient contacts without optional BES reporting fail the primary BES-supported predicate but can establish the timing sensitivity. A missing BES delivery or coverage interval retains its boundary or uncertainty. The Atom writes the shared outputs and `joint.csv`.

`experiments.clinical_outputs` supplies the complete registered aggregate grids; `inference.py` implements the fixed side fits, signed outcome and prediction weights, concentration radius, curvature remainder and continuous zero-entry frontier. `clinical_state` uses the native ordered local result rules. The shared schemas are explicit in `experiments.SCHEMAS`, with every field's scientific meaning defined in the incorporated statistical contract. They include `effects.csv`, `sensitivity.csv`, `profile.csv`, `fit.csv`, `observation.csv`, `contrasts.csv` and `disposition.json`.

Every plot-ready table has endpoint unit, period, stratum, variant, bandwidth and equality convention. Horizon and its day/birthday clock are explicit. Care-day outputs are already rescaled to days; binary outputs use risk units. Fitted completion envelopes use signed prediction weights and are not clipped to the outcome range or presented as confidence sets. `support_kind` distinguishes interpolation and extrapolation. A missing statistic is blank, never zero. `curvature_zero_M` is the continuous algebraic frontier; a computed infinite value is `inf` in CSV and described as `positive_infinity` in JSON metadata.

Fixed evaluation grid

The effects table contains every registered 2013/all endpoint at primary 200 g, equality omitted and $M=.05$. Bounded endpoints also retain hospital-dependence rows. The

three designated clinical age-five endpoints use $\alpha=.05/3$ for these primary family/hospital rows; other endpoints use $.05$. The uncapped care row has no numeric effect or confidence limits.

For all clinical endpoints, and for the care lead photo14, sensitivity output contains primary, h100 and h150 at all six registered M values; the remaining fixed score variants use $M=.05$. The primary curvature grid preserves the designated endpoint's α . h100/h150 and other score variants use $\alpha=.05$. The $M=.05$ primary reference is exported in both effects and sensitivity for the separate main and curvature bindings; it is one calculation, not an additional hypothesis.

Historical 2010–2011 rows apply to photo14 and the three clinical leads. Known lt32, ge32 and unknown gestation rows apply to the three clinical leads. These use the primary score specification and $\alpha=.05$. The period difference is 2013 minus 2010–2011; the known-stratum difference is ge32 minus lt32. Both use $\alpha=.025$ constituent confidence sets and the registered union-bound subtraction to produce a supplementary 95% difference set. No independence is assumed.

Respiratory secondary-diagnosis, gap30 and broader-observation variants preserve all six respiratory endpoints. The DG40-or-DG41 comparison preserves the epilepsy horizons and death-or-epilepsy composite; it does not alter DG80. Neurological timing and broader-observation variants preserve all six neurological endpoints. These are 2013/all, primary score, $M=.05$, family-dependence, $\alpha=.05$ comparisons. The historical and gestation populations never replace the primary year/roster.

Reusable verification and runtime requirements

```
python -B docs/execution/test_reference.py
python -B docs/execution/test_experiments.py
python -B docs/execution/test_figures.py
```

The first command exercises reusable mathematics and date helpers. The second runs semantic clinical and aggregate tests plus all five entry points on generated, clearly hypothetical CSVs in temporary directories outside the World. It tests missing/empty/support boundaries, versions and orphan joins; birth/death/birthday clocks; gestation and infant-first identity; optional versus missing BES; respiratory conjunction, transfers and recurrence; signed prediction weights; curvature frontiers; activation/direct dispatch; and copied code with a read-only World. The figure command delegates to the independently numbered visualization tests. Test logs and generated datasets are not delivered scientific evidence.

Unknown inpatient dates use exact finite completion enumeration at the registered horizons. `--max-completions N` is an optional caller resource budget; exceeding it returns operational `no_result`, never an approximate estimate, an invented hospital discharge or a statistical null. Large numbers of unknown dates may require a meaning-equivalent dynamic implementation in the governed environment. All currently unresolved source facts, linkages, version semantics, delivered periods and ascertainment remain actual runtime requirements. This template and its tests establish implementation behavior; they establish no availability, identifying variation, precision or empirical clinical finding.

Governed input and aggregate interface

The JSON manifest and table extracts are supplied inside the governed runtime. They are not empirical materials in this package. `runtime_inputs.Inputs` reads only the seven active allowed tables, with exact registered fields listed in `runtime_inputs.FIELDS`. CSV cells are strings so encrypted identifiers, raw codes and leading zeros survive. The source adapter strips whitespace, applies only provider-declared missing sentinels, and parses actual event/snapshot dates as ISO calendar dates. Invalid nonmissing dates are unresolved, not zero or missing.

Manifest objects

`snapshot` identifies the fixed extract vintage. `facts` is a dictionary of named documentary assertions, each containing `status=verified` and a nonempty `source` locator. The required names are `encryption_domain`, `contact_namespace`, `infant_identity`, `birth_contact_semantics`, `weight_grams` and `administrative_values` and `code_dictionary_complete`. The last assertion verifies the dictionary covers the registered code families and calendar periods; an absent code entry is not assumed invalid in an undocumented partial dictionary. Their meanings are the corresponding requirements of the scientific data contract: common encrypted join domains; global resolved contact namespace; deduplicated infant identity; true infant birth-contact roles; integer gram semantics and missing encodings; and the dated 0/2 patient-type, 1/2 admission-mode and born-here-8 administrative meanings. An assertion cannot be supplied by a successful test or inferred from the table name.

`institution` contains the documentary rows written to `institution.csv`: `item`, `source`, `date`, `judgment`, `scope`, and `reason`. The pivotal item keys are `DPS2012_schedule`, `all_newborn_scope`, `clinical_exceptions`, `equality_ambiguity`, `2013_timing`, and `bedside_score_alignment`. The operator records verified facts and qualified concerns from the actual frozen ledger. A direct contradiction takes precedence; unread/unverified pivotal items remain unresolved. Qualified rows retain their exact source, scope and limitation.

`code_dictionary` is a list with `code`, `valid_from`, `valid_to` and `source` for every supplied dated SKS entry used by the analysis. Validity bounds are inclusive ISO dates. Exact Danish diagnosis codes retain the D prefix. Prefix membership alone never substitutes for a date-valid entry. The dictionary hash enters execution provenance. No code validity or recode is inferred from a later label. For the separate nonliveborn source-contact audit, documentary dictionary entries may additionally carry `birth_status=not_liveborn`. The native protocol does not specify an ICD list for this ancillary audit, so code never supplies one. If no verified dated role mapping is supplied, that audit count remains unavailable. This does not alter the exact hospital-livebirth cohort whitelist.

`tables` has keys from the seven-table allowlist only. Each table specification contains `status` (`present`, `absent`, or `unresolved`), `path`, `fields`, `field_types`, `missing_values`, `row_unit`, `source`, `version_policy`, and `coverage`. Actual CSV

headers are checked against the required fields. A provider-documented absent delivery/field yields `data_gap`; an unread path or operational I/O failure yields `no_result`. Unknown semantics yield `unresolved`. `path` is absolute or relative to the manifest's directory. No mount is guessed.

`version_policy` is an object with a documentary `source`. `mode=resolved_extract` means the provider already resolved the table at the declared snapshot. Exact identical rows can still collapse with an aggregate duplicate audit. This mode does not make conflicting ADM or BEF keys valid. `mode=latest_as_of` additionally requires `identity_fields`, `order_fields` and an `as_of` list of the same length as `order_fields`. Their ordering must be provider-defined. A field declared `integer` is compared numerically; other documented order fields are compared as strings. Simultaneous conflicting versions stop the construct. `VERSION` and `LEVERANCEDATO` never become a clinical event date.

Where original tables use compound contact keys, a documented meaning-preserving adapter must encode that same compound identity consistently in `RECNUM` in every extract, preserve original-key provenance inside the governed source process, and verify the `contact_namespace` assertion. The reference adapter will not infer a compound key from overlapping records. Similarly, a supplied `identity_rekey` dictionary may only reflect the authorized provider linkage service on allowed-table identifiers; it requires an additional verified `facts.identity_rekey` source assertion. It is never guessed from CPR/PNR text.

Each `coverage` entry declares `start`, `end`, `status`, `kind` and `source`, with optional `pnr`. Intervals are closed. `status=complete` is the only assertion that licenses an absent-record zero. `kind=recording` describes the narrower register recording target; DODSAASG uses `kind=vital` for complete vital ascertainment. Omitted `pnr` or `pnr=*` applies to all linked eligible infants. Otherwise the entry applies only to its named infant. Contiguous documented intervals can be united; gaps remain gaps. Empty coverage is not complete coverage. Complete birth ascertainment in ADM, DIAG and FOEDSLER for 2013 is needed to define the primary birth frame; the code cannot repair missing births with outcome intervals.

`followup_linkage` documents individual followability separately from cohort identity. It requires `status=verified`, `source`, and either `all_identified_births=true` or explicit `linked_pnrs`. `unlinked_pnrs` always retain interval follow-up despite general source coverage. If this evidence is missing, absent follow-up records cannot establish zero. Observed qualifying records still supply known-event evidence when their actual links are verified. A missing mother link is not missing infant followability.

`sex_mapping` binds the actual raw `C_SEX` and `KOEN` codes to `male/female`; unmapped, missing or conflicting sex remains unknown. Optional `residence_intervals` contain `pnr`, `start`, `end`, `source` for genuinely affirmative continuous-residence evidence from the authorized data. Annual BEF snapshots alone cannot authorize these intervals. Without such evidence the broader-observation sensitivity retains its intentionally conservative bounds. No migration dates or unauthorized extra table are inferred.

Aggregate output and missingness

`experiments.SCHEMAS` is the executable column inventory; the shared statistical contract defines scientific meaning. Primary/effect rows are keyed by Atom, period, stratum, endpoint, variant, bandwidth, equality rule, M, alpha and dependence. Count and profile tables include units and clock metadata. Actual score profiles are never populated on a display grid; `fit.csv` alone contains 1 g drawing coordinates, signed completion envelopes and support type.

Empty/unknown quantities serialize as empty CSV cells or JSON null. A computed zero remains numeric. Row `status` and `reason` explain unavailable, interval, non-estimable, model-conflict and descriptive-only outputs. Confidence sets that span the feasible range remain reported. No midpoint is substituted for an identification envelope. Uncapped attendance retains descriptive side means; no causal interval is manufactured. Infinity for a computed curvature frontier is distinct from null and is explicitly documented in the provenance record.

`disposition.json` always separates `local_state` from `operational_status` and records `reason`, `completed_outputs`, `omitted_outputs`, and `claim_ceiling`. No `result` and inactivity are not scientific local verdicts. For prerequisite failures, unproduced tables are listed as omitted; no fake result rows are written.

The operator supplies predecessor dispositions as a JSON object keyed by exact Atom ID. For example, the actual `atom-000004` value must contain its realized `local_state` and `operational_status`; no example ready verdict is distributed as a runnable predecessor file. Each clinical entry activates only from a completed ready/qualified assignment result unless direct dispatch is explicitly selected. Direct dispatch still computes scientific prerequisites locally.

The source, dictionary and code hashes; snapshot; duplicate/orphan/date checks; source/cohort seal; dispatch policy; and any operational resource limit are written to the caller's documentation directory. Person-level records are never written to this portable World. These aggregate files remain governed evidence: authorized disclosure review and suppression precede public distribution. Suppression must preserve unavailable reasons and prevent reconstruction from released totals; the reference analysis does not invent a disclosure threshold.

Complete registered Molecule

```
id: molecule-000001
molecule_mode: prereg
molecule_shape: convergent
topic: Newborn care thresholds
rating: C
draft: false
membership:
- atom: atom-000004
  role: primary
  description: Shared assignment, infant identity, score and baseline validity judgment.
- atom: atom-000005
  role: supplementary
  description: Recorded implementation and hospital-use context; no receipt IV.
```

- atom: atom-000006
 - role: primary
 - description: All-birth survival through five.
- atom: atom-000007
 - role: primary
 - description: Acute respiratory admission and recurrence with competing
 - ↪ risks.
- atom: atom-000008
 - role: primary
 - description: Neurological diagnosis recording and surveillance limits.

literature: []

frontier:

- rule: Evaluate one conditional1500 g clinical care-recommendation
 - ↪ quasi-experiment
 - for childhood health.
- avoid: No observational replacement, raw data access in preparation,
 - ↪ treatment-receipt
 - LATE, biological birthweight effect, schooling without an authorised
 - ↪ table,
 - or favourable-outcome selection.
- directions: []

preregistration:

- mode: adaptive
- question: Can the 2013 Danish1500 g newborn care-recommendation contrast
 - identify consequences for health through age five?
- scope: All public-hospital livebirth infants in 2013, all
 - ↪ gestations/multiplicities,
 - within 200 g of 1500; primary equality omission; fixed2010-2011 context;
 - three primary age 5 endpoints and registered supplementary comparisons
 - only.
- storyline: The main text starts with the distinction between a smooth
 - ↪ biological
 - risk gradient and a discontinuous clinical recommendation. It specifies
 - the dated 2012 schedule and fixed 2013 all-birth comparison, then shows
 - actual score support and ancillary missingness before recorded-care
 - ↪ evidence.
 - The three primary age-five endpoints are compared on the same
 - ↪ risk-difference
 - scale with family and hospital uncertainty; the registered cumulative
 - horizons are then shown on an age axis to distinguish early accumulated
 - differences from later accumulation without estimating hazards or onset.
 - Survival, respiratory recurrence, neurological recording, death-or-event
 - contrasts and descriptive joint states constrain the interpretation
 - ↪ together.
 - More diagnoses may accompany longer survival or more recording; no causal
 - mediation, always-survivor effect or welfare ranking follows. Main text
 - retains score, institutional, curvature, dependence and ascertainment
 - limitations. SI explains full construction and all detailed results;
 - ↪ preregistration/result
 - maps retain all activation and interpretation alternatives; engineering
 - docs own executable interfaces. Every placement is fixed before outcomes
 - and every original endpoint and variant remains required within its
 - ↪ registered
 - scope. The BES-based primary neurological target is narrower than all
 - completed acute diagnosis contacts after the 2014 optional-visit-date
 - change; its existing timing sensitivity reveals a joint
 - ↪ ascertainment/timing
 - distinction, not a new primary phenotype. All Atoms remain pending.

interpretation:

- kind: restriction

```

condition: state(atom-000004) == "contradicted"
says: The assignment route is contradicted. Describe the precise
↳ institution/recording
    conflict and stop the causal headline. An observational substitute is
    not completion of the required objective.
- kind: restriction
condition: (state(atom-000004) == "unresolved") OR (state(atom-000004)
    == "data_gap") OR (state(atom-000004) == "otherwise") OR
    ↳ (terminal(atom-000004)
    == "no_result")
says: Separate unresolved pivotal facts, evidenced unavailable inputs
    and operational failure. Clinical Atoms remain pending/inactive as
    ↳ appropriate;
    no negative-health conclusion.
- kind: restriction
condition: state(atom-000004) == "qualified"
says: Any subsequent contrast retains the named
↳ score/continuity/implementation
    qualifications. Favourable clinical estimates do not override these
    concerns; use a conditional or boundary headline.
- kind: restriction
condition: state(atom-000006) == "data_gap"
says: The survival result has the Atom-specific data_gap limitation.
↳ Retain
    this endpoint and its alpha allocation; report the precise reason and
    assumptions, without substitution or a null claim.
- kind: restriction
condition: state(atom-000006) == "unresolved"
says: The survival result has the Atom-specific unresolved limitation.
    Retain this endpoint and its alpha allocation; report the precise reason
    and assumptions, without substitution or a null claim.
- kind: restriction
condition: state(atom-000006) == "non_estimable"
says: The survival result has the Atom-specific non_estimable limitation.
    Retain this endpoint and its alpha allocation; report the precise reason
    and assumptions, without substitution or a null claim.
- kind: restriction
condition: state(atom-000006) == "model_conflict"
says: The survival result has the Atom-specific model_conflict limitation.
    Retain this endpoint and its alpha allocation; report the precise reason
    and assumptions, without substitution or a null claim.
- kind: restriction
condition: state(atom-000006) == "sensitivity_limited"
says: The survival result has the Atom-specific sensitivity_limited
↳ limitation.
    Retain this endpoint and its alpha allocation; report the precise reason
    and assumptions, without substitution or a null claim.
- kind: primary
condition: state(atom-000006) == "lower"
says: Death before age five is lower under the lower-weight schedule,
    conditional on all shared assumptions and preceding restrictions.
↳ Interpret
    an all-birth local recommendation-bundle contrast, never a phototherapy
    LATE or a change in birthweight itself.
- kind: primary
condition: state(atom-000006) == "higher"
says: Death before age five is higher under the lower-weight schedule,
    conditional on all shared assumptions and preceding restrictions.
↳ Interpret
    an all-birth local recommendation-bundle contrast, never a phototherapy

```

LATE or a change in birthweight itself.

- kind: restriction
condition: state(atom-000007) == "data_gap"
says: The respiratory admissions result has the Atom-specific data_gap limitation. Retain this endpoint and its alpha allocation; report the precise reason and assumptions, without substitution or a null claim.
- kind: restriction
condition: state(atom-000007) == "unresolved"
says: The respiratory admissions result has the Atom-specific unresolved limitation. Retain this endpoint and its alpha allocation; report the precise reason and assumptions, without substitution or a null claim.
- kind: restriction
condition: state(atom-000007) == "non_estimable"
says: The respiratory admissions result has the Atom-specific
↳ non_estimable
limitation. Retain this endpoint and its alpha allocation; report the precise reason and assumptions, without substitution or a null claim.
- kind: restriction
condition: state(atom-000007) == "model_conflict"
says: The respiratory admissions result has the Atom-specific
↳ model_conflict
limitation. Retain this endpoint and its alpha allocation; report the precise reason and assumptions, without substitution or a null claim.
- kind: restriction
condition: state(atom-000007) == "sensitivity_limited"
says: The respiratory admissions result has the Atom-specific
↳ sensitivity_limited
limitation. Retain this endpoint and its alpha allocation; report the precise reason and assumptions, without substitution or a null claim.
- kind: primary
condition: state(atom-000007) == "lower"
says: The registered respiratory admissions endpoint is lower under the lower-weight schedule, conditional on all shared assumptions and
↳ preceding
restrictions. Interpret an all-birth local recommendation-bundle
↳ contrast,
never a phototherapy LATE or a change in birthweight itself.
- kind: primary
condition: state(atom-000007) == "higher"
says: The registered respiratory admissions endpoint is higher under the lower-weight schedule, conditional on all shared assumptions and
↳ preceding
restrictions. Interpret an all-birth local recommendation-bundle
↳ contrast,
never a phototherapy LATE or a change in birthweight itself.
- kind: restriction
condition: state(atom-000008) == "data_gap"
says: The neurological recording result has the Atom-specific data_gap limitation. Retain this endpoint and its alpha allocation; report the precise reason and assumptions, without substitution or a null claim.
- kind: restriction
condition: state(atom-000008) == "unresolved"
says: The neurological recording result has the Atom-specific unresolved limitation. Retain this endpoint and its alpha allocation; report the precise reason and assumptions, without substitution or a null claim.
- kind: restriction
condition: state(atom-000008) == "non_estimable"
says: The neurological recording result has the Atom-specific
↳ non_estimable
limitation. Retain this endpoint and its alpha allocation; report the

```

precise reason and assumptions, without substitution or a null claim.
- kind: restriction
condition: state(atom-000008) == "model_conflict"
says: The neurological recording result has the Atom-specific
↳ model_conflict
    limitation. Retain this endpoint and its alpha allocation; report the
    precise reason and assumptions, without substitution or a null claim.
- kind: restriction
condition: state(atom-000008) == "sensitivity_limited"
says: The neurological recording result has the Atom-specific
↳ sensitivity_limited
    limitation. Retain this endpoint and its alpha allocation; report the
    precise reason and assumptions, without substitution or a null claim.
- kind: primary
condition: state(atom-000008) == "lower"
says: The registered neurological recording endpoint is lower under the
    lower-weight schedule, conditional on all shared assumptions and
    ↳ preceding
    restrictions. Interpret an all-birth local recommendation-bundle
    ↳ contrast,
    never a phototherapy LATE or a change in birthweight itself.
- kind: primary
condition: state(atom-000008) == "higher"
says: The registered neurological recording endpoint is higher under the
    lower-weight schedule, conditional on all shared assumptions and
    ↳ preceding
    restrictions. Interpret an all-birth local recommendation-bundle
    ↳ contrast,
    never a phototherapy LATE or a change in birthweight itself.
- kind: supplementary
condition: state(atom-000005) == "higher_recording"
says: The recorded-phototherapy margin supports an observable
↳ implementation
    response. It does not establish total receipt, exclusion restriction
    or mediation.
- kind: supplementary
condition: (state(atom-000005) == "lower_recording") OR
↳ (state(atom-000005)
    == "otherwise") OR (state(atom-000005) == "partial") OR
    ↳ (state(atom-000005)
    == "data_gap") OR (terminal(atom-000005) == "no_result")
says: Explain the recorded-care uncertainty or discordance. It is not
    proof that eligibility has no effect and does not select whether health
    is tested.
- kind: supplementary
condition: (state(atom-000006) == "lower") AND ((state(atom-000007) ==
    "higher") OR (state(atom-000008) == "higher"))
says: Better survival alongside more recorded morbidity is consistent
    with additional survival opportunity and/or detection. Consult
    ↳ registered
    joint/composite outcomes; do not infer harm to always-survivors.
- kind: supplementary
condition: (state(atom-000006) == "higher") AND ((state(atom-000007) ==
    "lower") OR (state(atom-000008) == "lower"))
says: Less recorded morbidity with worse survival does not establish
↳ improved
    child health; the competing-risk interpretation is essential.
- kind: primary
condition: (state(atom-000006) == "otherwise") AND (state(atom-000007)
    == "otherwise") AND (state(atom-000008) == "otherwise")

```

```

says: The registered clinical contrasts do not resolve direction within
      their uncertainty sets. Report ranges and curvature/dependence
      ↪ sensitivity;
      do not claim equivalence, safety, no treatment or successful absence
      of effects.
- kind: residual
  condition: 'TRUE'
  says: Report every remaining endpoint, pending/nonactivated Atom,
      ↪ unresolved
      finding and operational no_result explicitly. All Atoms are members
      from birth. Restrictions take precedence; compatible endpoint-specific
      primary and supplementary statements compose without overriding one
      another. No aggregate vote converts mixed or incomplete evidence into
      a causal success.

```

Authority is the native registration above and the member Atom registrations.

Current interpretation

All five Atoms are pending. No experimental findings exist.

atom-000004: Assignment validity

Shared normative specifications: docs/protocol/data-contract.md (all sections) and docs/protocol/statistical-analysis.md (all sections) are incorporated here, including exact fields, version-aware joins, date-valid SKS, birth-first cohort, assignment, fixed estimator, missing-outcome envelope, multiplicity, diagnostics, variants and output columns. docs/protocol/identification.md supplies the documented institution and unresolved facts. No observed values have been read. All status decisions are ordered first-match; an operational failure produces terminal no_result, never a scientific verdict. No outcome-based route selection is authorised.

Population/unit: all public-hospital livebirth contacts in 2013 and the fixed2010–2011 context period; infant birth event, never mother-contact count. Score window1300–1700 g inclusive; all gestations and multiplicities. Follow-up and maternal linkage are not entry criteria.

Ordered pseudocode: A. Read the frozen source ledger. Confirm DPS2012 clinical eligibility schedule, all-newborn scope, exceptions, equality ambiguity and 2013 timing. Compare any newly supplied dated local rule before outcomes. A documented policy applying a continuous or different weight rule instead throughout the target setting is a contradiction. Partial/local exceptions qualify the scope; an unread document is unresolved. Do not infer absence of assignment from missing phototherapy or a p-value. No on-the-fly hospital/time subset is permitted; scope changes require Blueprint amendment before outcome inspection. B. Execute version/key assertions and infant roster construction from data-contract.md. Produce sequential exclusion/disposition ledger with disjoint primary reasons: nonbirth/maternal; not liveborn; outside birth setting; duplicate event resolved; ambiguous infant identity; birth date unresolved; weight missing/invalid; weight conflicting; outside1300–1700; exact 1500 omitted from primary; primary positive-weight roster. Reasons not applicable at a stage are not double-counted. Unresolved/duplicate issues are retained in audits; cannot obtain

cohort by excluding unidentified early deaths. Require provider documentation distinguishing missing identifier from a real anonymised infant. C. Construct ancillary sex, birth month, hospital, multiplicity known/unknown, mother linkage and gestation as in the contract. For descriptive multiplicity classification, require consistent child-order plus DZ38 subtype or maternal DZ370 support in that year’s dictionary; never A alone. No singleton-only primary analysis is authorised. D. Compute each integer score frequency, heaping fractions, mass points, nearest support gaps, family grouping, and linear weights using no health outcomes. Compute baseline summaries and the registered composition diagnostics. Missing gestation never disqualifies the all-gestation design. Record exact failed assertions and unresolved facts separately from composition flags. E. Define readiness as a deduplicated infant score roster, interpretable birthweight assignment and available support, with no demonstrated contradiction. Required key/score semantic ambiguity gives unresolved; actual absent birth/weight fields gives data_gap. A heaping/composition flag, known score mismatch concern, local implementation uncertainty supported by conflicting practice documentation, or incomplete ancillary covariates gives qualified rather than proof of failure. No empirical test grants unqualified exchangeability. If rank is insufficient, report qualified with support warning so each clinical endpoint can return non_estimable. F. Seal the source and cohort audit before downstream outcome inspection. Do not condition activation on neonatal receipt, mortality or morbidity. Publish all observable baseline diagnostics, including exact 1500 composition and exclusions; no fabricated counts. Retain confidential unit-level linkage evidence only in the governed environment.

Outputs: disposition.json; cohort-flow.csv(stage,reason,period,n_all,n_left,n_equal,n_right,status); score.csv(period,weight_g,n,status); baseline.csv(period,variable,category,side,n,known_n,value,unit,status); balance.csv(variable,period,estimate,ci_low,ci_high,flag,reason); support.csv(period,variant,n_left,n_right,mass_left,mass_right,nearest_left_g,nearest_right_g,effective_n,max_g); institution.csv(item,source,date,judgment,scope,reason). source dates are documentary facts, not empirical outcomes. Plot-ready score and baseline tables support Figure 2; concept Figure 1 is nonempirical.

Synthetic checks required at transcription: maternal delivery row not counted as infant; twins with A/B order both retained; infant dying before first BEF still enters; outpatient2013 birth accepted; duplicate-version conflict stops; missing gestation does not remove an infant; DU31D6 and DU32D0 classify correctly; antenatal code rejected; exact 1500 has no primary fit weight; no side support remains a boundary rather than a zero estimate; unknown prerequisites are not FALSE. Interface refinement: baseline.csv includes weight_g, nullable for side aggregates. In addition to side summaries, emit actual-score rows for variables mother_unknown and gestation_unknown, value=proportion, one row per period/variable/weight_g. category=unknown, side derives from the score; exact 1500 uses side=equality. These are the registered missingness diagnostics, not additional estimands. The cohort-flow.csv reason keys are infant_birth_contacts, nonbirth_maternal, not_liveborn, outside_setting, duplicate_resolved, identity_unresolved, date_unresolved, weight_missing_invalid, weight_conflicting, outside_window, window_roster, equality, kernel_roster, mother_unknown, gestation_unknown. The last two are retained characteristics, not exclusions. Use these stable keys in the manuscript’s flow table. For balance.csv

use variable keys `sex_male`, `gestation_days`, `gestation_lt32`, `mother_unknown`, `gestation_unknown`, `hospital_tv`, `birth_month`, `multiplicity_unknown`. For `hospital_tv` use `estimate=total-variation` summary with no invented confidence interval. For month/multiplicity distributions use `baseline.csv` category rows plus a textual descriptive summary in `balance.csv.reason`, with no invented scalar effect.

The date-valid hospital-birth whitelist is DZ380/DZ383/DZ386 and documented hospital-born descendants; the broader DZ38* search is an audit frame only. Apply the exact source administrative values and 2014 contact-type change documented in `data-contract.md`.

Final Blueprint clarification (2026-09-09 UTC): the incorporated shared contracts include the dated optional-BES ascertainment distinction, sign-aware fitted envelopes and explicit aggregate metadata. Figure and table allocation is specified in `docs/story/blueprint.md` and `docs/paper/figures.yaml`; it introduces no new estimator, endpoint, subgroup, activation rule or local result state. All original scientific commitments remain in force. Figures 4 and 5 compare the three clinical domains at age five and at the already registered cumulative horizons; Figure 6 is the curvature sensitivity. Plot order does not create a computational dependency.

Remaining registration fields

The `preregistration.protocol` field is reproduced in full immediately above; all remaining fields are reproduced below.

```
id: atom-000004
topic: Assignment validity
atom_result: prereg
atom_strength: null
atom_shape: null
evidence_paths: []
concepts: []
literature: []
bonds: []
preregistration:
  version: 1
  mode: adaptive
  question: Does the 2013 care-recommendation contrast admit a measurable
    and conditionally credible local comparison?
  rationale: This consequential shared diagnostic distinguishes a contradicted
    institution, unresolved measurement and a defensible conditional
    ↪ comparison.
    It also describes the birth population and score support needed to
    ↪ interpret
    all subsequent experiments.
  assumption: The dated2012 clinical recommendation can supply a local
    ↪ eligibility
    encouragement, conditional on the explicitly registered score, continuity,
    observation and curvature assumptions. Documentation alone does not
    ↪ establish
    realised validity.
  target_strength: descriptive
  target_shape: comparison
  ratings:
    importance: 5
    novelty: 3
```

```

feasibility: 3
data_advantage: 4
informativeness: 0.7
tables:
- LPR_ADM
- LPR_FOEDSLER
- LPR_DIAG
- BEF
activation: 'TRUE'
verdicts:
- key: contradicted
  region: Dated evidence directly contradicts the stipulated care-assignment
    rule in the target setting, or verified selective score/infant recording
    demonstrably breaks the stipulated assignment mapping.
  says: The central quasi-experimental route is contradicted; no
    ↪ observational
    replacement counts as success.
- key: data_gap
  region: A mandatory infant birth/contact/weight source is demonstrably
    absent within the allowed boundary.
  says: The required cohort or score is unavailable; no statistical
    ↪ conclusion.
- key: unresolved
  region: A pivotal assignment, birth-unit, identity or score fact remains
    unverified, so a meaningful roster/contrast cannot yet be specified
    for execution.
  says: The route remains unresolved, not established impossible.
- key: qualified
  region: A roster and assignment comparison are defined without direct
    contradiction, but one or more registered
    ↪ heaping/composition/support/ancillary
    or local-practice concerns is present.
  says: Proceed with fixed estimates and explicit causal qualifications;
    do not repair concerns by selective controls or outcome-driven scope
    changes.
- key: ready
  region: The roster and documented assignment are interpretable and no
    registered flag is raised; required source/identity assertions are
    ↪ satisfied.
  says: A conditional quasi-experiment is executable; continuity, policy
    relevance and absence of sorting remain assumptions.
- key: otherwise
  region: otherwise
  says: The assignment judgment remains unresolved.

```

Registered experiment

This consequential shared diagnostic distinguishes a contradicted institution, unresolved measurement and a defensible conditional comparison. It also describes the birth population and score support needed to interpret all subsequent experiments. All empirical results are pending.

atom-000005: Recorded care response

Shared normative specifications: docs/protocol/data-contract.md (all sections) and docs/protocol/statistical-analysis.md (all sections) are incorporated here, including

exact fields, version-aware joins, date-valid SKS, birth-first cohort, assignment, fixed estimator, missing-outcome envelope, multiplicity, diagnostics, variants and output columns. docs/protocol/identification.md supplies the documented institution and unresolved facts. No observed values have been read. All status decisions are ordered first-match; an operational failure produces terminal no_result, never a scientific verdict. No outcome-based route selection is authorised.

Use the fixed infant roster, dates, family groups and score weights from atom-000004. Independent scientific target: reduced-form differences in recorded clinical care, with descriptive patterns as necessary when coding is incomplete. No receipt-based LATE, mediation fraction, cost-benefit or welfare measure is identified.

Operationalisation/pseudocode: 1. Deduplicate SKSUBE by documented procedure identity; exact repeated RECNUM,C_OPR,D_ODTO,C_TILOPR rows collapse. Validate many-to-one ADM join and procedure date within the linked contact and infant life. BNGC or BNGC0, date-valid since 1999, count once per infant if a procedure occurs in[day 0,day 14). This is recorded phototherapy, not all receipt; an absent code equals no recorded procedure only in a complete file. Days14–27 are not assigned the birthweight-based schedule because the guideline subsequently uses current weight; [day 0,day 28) is an explicit supplementary measure, not a substitute. 2. For inpatient C_PATTYPE=0 after historical value validation, union occupied calendar dates overlapping[day 0,day 28), across transfers and simultaneous contacts. Define inpatient days as count of unique dates, capped 28; an admission and discharge on the same date contributes1. Death truncates subsequent occupancy; no assumed continued stay after death. Missing discharge date has lower occupancy from observed dates and upper occupancy through min(day 27,death), marked interval. If a supplied file is insufficient to certify absence of further inpatient contacts, extend the upper bound to28. 3. Validate outpatient C_PATTYPE=2 and BES actual visit dates within contact dates. Count unique infant×calendar-date visits in[day 28,first birthday), excluding dates belonging to the continuous initial birth inpatient spell. Primary care-use scale is min(visit-days,20); produce the uncapped count as descriptive only. Transfers are not additional outpatient dates. Do not label visits preventive, planned, needed, excessive or beneficial from these fields. Unknown eligible days give lower observed count and upper20 for the capped measure. 4. Produce gram-level profiles and side fits for phototherapy14 and inpatient days28. Apply the shared bounded-outcome contrast and 95% intervals (all care endpoints supplementary), scaled units where appropriate. Repeat fixed historical and specification variants for phototherapy14. No care-response result alters health activation. 5. Compare recorded phototherapy with general inpatient/outpatient changes. A positive recorded-phototherapy contrast supports a recorded implementation margin; flat or negative recordings do not establish no treatment contrast because reporting and severity differ. Coded treatment is not an exclusive channel. A birth-hospital variation ledger reports coded fractions by era; it never selects the best-reporting hospital for the main estimate.

Outputs: shared effects/profile/fit/sensitivity/observation/disposition files; hospital-care.csv(period,hospital_code,endpoint,n,known_n,mean_lower,mean_upper,status) for controlled disclosure. Endpoint keys photo14,photo28,inpatient_days28,outpatient_days1_cap20,outpatient

For the uncapped row only descriptive n and mean with no causal confidence interval; not included in state adjudication. Figures3 and supplementary Table S7 carry these distinctions.

Synthetic checks: BNGC plusBNGC0 duplicate date counts once; treatment atday14 excluded fromphoto14 but included inphoto28; same-day hospital transfer not two occupied days; overnight birth stay crosses dates correctly; outpatient opening without BES is not a visit; death before 14 does not remove the infant; missing procedure table is partial if other care outputs exist; all-zero recorded procedures retain nonzero concentration uncertainty. Clinical receipt cannot be inferred from coding zero.

Adjudication: photo14 is the predeclared lead implementation endpoint; other outputs qualify its interpretation but do not swap into its place. Data_gap if all care constructs demonstrably unavailable; partial if photo14 cannot be computed but another care output can. Otherwise classify the 95% reference-M photo14 set, and retain secondary counts whether positive, negative or unresolved. Write care-descriptive.csv(period,endpoint,mean_left,mean_right,n_left,n_right,status,reason) for uncapped outpatient-days side means only. Native effects.csv includes their status row but no fabricated inferential contrast. For photo14 historical and other registered supplementary differences write contrasts.csv under the shared union-bound specification.

Final Blueprint clarification (2026-09-09 UTC): the incorporated shared contracts include the dated optional-BES ascertainment distinction, sign-aware fitted envelopes and explicit aggregate metadata. Figure and table allocation is specified in docs/story/blueprint.md and docs/paper/figures.yaml; it introduces no new estimator, endpoint, subgroup, activation rule or local result state. All original scientific commitments remain in force. Figures 4 and 5 compare the three clinical domains at age five and at the already registered cumulative horizons; Figure 6 is the curvature sensitivity. Plot order does not create a computational dependency.

Outpatient clarification: outpatient_days1_cap20 and outpatient_days1_uncapped count BES-recorded visit-days. From 2014 an acute outpatient visit date can legally be absent; do not infer a visit-day from ADM completion. A complete acute contact without BES contributes no BES date, while a demonstrably incomplete BES delivery retains registered bounds. DODSAASG supplies the already required death/lifespan evidence; unknown vital status retains bounds and never conditions activation on a mortality estimate.

Remaining registration fields

The preregistration.protocol field is reproduced in full immediately above; all remaining fields are reproduced below.

```
id: atom-000005
topic: Recorded care response
atom_result: prereg
atom_strength: null
atom_shape: null
evidence_paths: []
concepts: []
```

```

literature: []
bonds: []
preregistration:
  version: 1
  mode: adaptive
  question: Does assignment to the lower-weight care schedule change recorded
    neonatal treatment and subsequent hospital contact?
  rationale: Recorded care links the documented recommendation to observable
    clinical behaviour. It distinguishes an observable response from
    ↪ under-recording
    and gives utilisation context for later health; it never supplies a
    ↪ treatment-receipt
    IV denominator.
  assumption: The dated2012 clinical recommendation can supply a local
    ↪ eligibility
    encouragement, conditional on the explicitly registered score, continuity,
    observation and curvature assumptions. Documentation alone does not
    ↪ establish
    realised validity.
  target_strength: descriptive
  target_shape: comparison
  ratings:
    importance: 5
    novelty: 3
    feasibility: 3
    data_advantage: 4
    informativeness: 0.7
  tables:
    - LPR_ADM
    - LPR_FOEDSLER
    - LPR_DIAG
    - LPR_SKSUBE
    - LPR_BES
    - BEF
    - DODSAASG
  activation: (state(atom-000004) == "ready") OR (state(atom-000004) ==
    ↪ "qualified")
  verdicts:
    - key: data_gap
      region: All registered care constructs are demonstrably unavailable.
      says: No recorded-care evidence; health analyses are not cancelled.
    - key: partial
      region: The photo14 construct is unavailable or unresolved but at least
        one other registered care output is computed.
      says: Report only the named recorded-care margins; treatment-receipt
        ↪ relevance
        remains unresolved.
    - key: non_estimable
      region: Photo14 is defined but the shared score design is rank deficient.
      says: Recorded care is described without a local estimate.
    - key: model_conflict
      region: The photo14 reference-M interval has empty feasible intersection.
      says: The specified model is incompatible; do not claim a response.
    - key: higher_recording
      region: The 95% photo14 reference-M interval is wholly above 0.
      says: More recorded phototherapy below 1500 supports this recorded margin,
        not complete receipt or its isolated health effect.
    - key: lower_recording
      region: The 95% photo14 reference-M interval is wholly below 0.
      says: The recorded response differs from the simple anticipated margin;

```

```

    reporting and other care remain possible explanations.
- key: otherwise
  region: otherwise
  says: The recorded response is unresolved; no claim of zero treatment
        or equivalence.

```

Registered experiment

Recorded care links the documented recommendation to observable clinical behaviour. It distinguishes an observable response from under-recording and gives utilisation context for later health; it never supplies a treatment-receipt IV denominator. All empirical results are pending.

atom-000006: Survival consequences

Shared normative specifications: docs/protocol/data-contract.md (all sections) and docs/protocol/statistical-analysis.md (all sections) are incorporated here, including exact fields, version-aware joins, date-valid SKS, birth-first cohort, assignment, fixed estimator, missing-outcome envelope, multiplicity, diagnostics, variants and output columns. docs/protocol/identification.md supplies the documented institution and unresolved facts. No observed values have been read. All status decisions are ordered first-match; an operational failure produces terminal no_result, never a scientific verdict. No outcome-based route selection is authorised.

Population is the complete fixed birth roster, including infants dying before a BEF snapshot or discharge. Outcome unit is infant; time zero is verified birth date. Primary endpoint death5=1(death before fifth birthday), with death28,death1,death3 as cumulative supplementary endpoints. The death28 horizon is exactly 28 days; calendar-year birthdays follow the shared contract. No cause-of-death outcome is registered because classification adds no necessary identifying contrast and would require separate validation.

Pseudocode: 1. Verify DODSAASG's supplied date coverage and whether it includes early neonatal and historical deaths despite a 2022 field-list date. Join by resolved infant PNR, at most one consistent death date; conflicting or impossible dates remain unresolved. Do not infer deaths from BEF disappearance. 2. At every horizon construct[L,U]: death before horizon gives[1,1]; proven life at/after horizon or known later death gives[0,0]; otherwise apply documented complete vital ascertainment if justified, else[0,1]. Record the source of proof, including later BEF, without requiring that proof at entry. A missing mother link has no effect on this rule. 3. Fit the shared sign-aware local contrast. death5 uses $\alpha=.05/3$ and $M=.05$; supplementary horizons and variants use 95% sets. Output family- and hospital-dependence sensitivity, curvature grid, fixed bandwidth/equality/rounding variants, historical death5 and gestation-stratum death5. No subgroup-specific alpha reuse. 4. Evaluate the monotonicity of each child's cumulative bounds across time; child death can occur once and known life before a later death must not be treated as survival beyond it. Cumulative lower and upper risks may each only increase with horizon. If the extractor breaks this invariant, stop this output as unresolved rather than smoothing it. 5. Send

death-date/interval flags through the governed interface to respiratory and neurological analyses. Their activation does not require successful death estimation: unknown vital status produces composite bounds, while known hospital events still inform their recording targets. A failed mortality Atom is not a mortality null.

Outputs: shared files; endpoint keys death28,death1,death3,death5; survival.csv(horizon,n__births,n__dead,n__proven_alive,n__unknown,status). Death5 supplies the primary local state. Figures4/5/6 and TablesS3/S4/S5/S6/S8 are bindings, not additional tests.

Synthetic checks: death on birthdate counts; death on fifth birthday excluded fromdeath5; death recorded later proves survival to earlier horizon; infant missing BEF but with neonatal death retained; conflicting death dates not averaged; a zero-event dataset has nonzero uncertainty; mortality[0,1] propagates through bounds and composites rather than imputed survival; no survivor-only denominator.

Final Blueprint clarification (2026-09-09 UTC): the incorporated shared contracts include the dated optional-BES ascertainment distinction, sign-aware fitted envelopes and explicit aggregate metadata. Figure and table allocation is specified in docs/story/blueprint.md and docs/paper/figures.yaml; it introduces no new estimator, endpoint, subgroup, activation rule or local result state. All original scientific commitments remain in force. Figures 4 and 5 compare the three clinical domains at age five and at the already registered cumulative horizons; Figure 6 is the curvature sensitivity. Plot order does not create a computational dependency.

Remaining registration fields

The preregistration.protocol field is reproduced in full immediately above; all remaining fields are reproduced below.

```
id: atom-000006
topic: Survival consequences
atom_result: prereg
atom_strength: null
atom_shape: null
evidence_paths: []
concepts: []
literature: []
bonds: []
preregistration:
  version: 1
  mode: adaptive
  question: What is the effect of the lower-weight care schedule on death
    before age five?
  rationale: Survival is a direct clinical endpoint and establishes the
    ↪ competing-risk
    context needed to interpret hospital morbidity without selecting
    ↪ survivors.
  assumption: The dated2012 clinical recommendation can supply a local
    ↪ eligibility
    encouragement, conditional on the explicitly registered score, continuity,
    observation and curvature assumptions. Documentation alone does not
    ↪ establish
    realised validity.
  target_strength: causal
```

```

target_shape: comparison
ratings:
  importance: 5
  novelty: 3
  feasibility: 3
  data_advantage: 4
  informativeness: 0.7
tables:
- LPR_ADM
- LPR_FOEDSLER
- LPR_DIAG
- BEF
- DODSAASG
activation: (state(atom-000004) == "ready") OR (state(atom-000004) ==
↳ "qualified")
verdicts:
- key: data_gap
  region: A required outcome table/period/field is demonstrably absent or
    the registered construct cannot be obtained from the allowed sources.
  says: This endpoint cannot be evaluated in the supplied boundary; no null
    or replacement association.
- key: unresolved
  region: Outcome timing, linkage or coding semantics required to calculate
    even the registered interval remain unverified.
  says: The endpoint remains unresolved; evidence is not negative.
- key: non_estimable
  region: The cohort is defined but fewer than two positive-weight mass
    points on a side or a rank-deficient design prevents the registered
    contrast.
  says: Report support; no estimated local effect and no bandwidth
    ↳ expansion.
- key: model_conflict
  region: The reference-M confidence set has empty intersection with the
    feasible effect range.
  says: The registered model/curvature specification conflicts with the
    realised evidence; no directional causal claim.
- key: sensitivity_limited
  region: The primary reference-M simultaneous interval excludes zero, but
    hospital-group sensitivity or any of h100, h150 and wider-gap variants
    is unavailable or contains zero, or any other registered specification
    has a 95% interval wholly in the opposite direction.
  says: A directional contrast is supported only under the named restricted
    assumptions/specification; explain the dependence or support
    ↳ sensitivity.
- key: lower
  region: The primary reference-M interval is wholly below zero and none
    of the preceding regions applies.
  says: The lower-weight schedule has a lower endpoint under the registered
    causal, recording, curvature and dependence assumptions; not an isolated
    treatment effect.
- key: higher
  region: The primary reference-M interval is wholly above zero and none
    of the preceding regions applies.
  says: The lower-weight schedule has a higher endpoint under the registered
    assumptions; distinguish health, survival and recording channels.
- key: otherwise
  region: otherwise
  says: Direction remains unresolved, including intervals containing zero
    or spanning the whole feasible range. No equivalence or safety
    ↳ conclusion.

```

Registered experiment

Survival is a direct clinical endpoint and establishes the competing-risk context needed to interpret hospital morbidity without selecting survivors. All empirical results are pending.

atom-000007: Respiratory consequences

Shared normative specifications: docs/protocol/data-contract.md (all sections) and docs/protocol/statistical-analysis.md (all sections) are incorporated here, including exact fields, version-aware joins, date-valid SKS, birth-first cohort, assignment, fixed estimator, missing-outcome envelope, multiplicity, diagnostics, variants and output columns. docs/protocol/identification.md supplies the documented institution and unresolved facts. No observed values have been read. All status decisions are ordered first-match; an operational failure produces terminal no_result, never a scientific verdict. No outcome-based route selection is authorised.

Use the fixed infant birth roster, not a discharge cohort. The primary endpoint is resp5, any new qualifying acute public somatic inpatient respiratory spell starting at or after day 28 and strictly after the initial birth spell ends, before the fifth birthday. Its estimand is recorded admission occurrence among all births, with death a competing terminal event, not a cause-specific hazard conditional on survival.

Coding: date-valid Danish ICD-10 prefixes DJ12,DJ13,DJ14,DJ15,DJ16,DJ17,DJ18,DJ20,DJ21,DJ22; retain valid descendants. Primary diagnosis C_DIAGTYPE=A, acute C_INDM=1 and inpatient C_PATTYPE=0, each checked against the dated provider dictionary. Secondary-diagnosis sensitivity uses A or B. These codes define pneumonia/acute bronchitis/bronchiolitis/lower respiratory infection recordings; they do not identify pathogen-specific RSV or all respiratory disease. No prescription proxy.

Pseudocode: 1. Reduce DIAG to contact flags using exact roles and code-validity intervals at contact start. Left-join to resolved inpatient ADM contacts without multiplying episodes. Classify acute status on the same contact carrying the qualifying diagnosis: do not combine an acute transfer in one record with an unrelated respiratory code on another to create a false event. 2. Per infant, union overlapping inpatient intervals and transfers separated by at most 1 calendar day. Retain each component RECNUM. Initial birth spell comprises contacts spanning birth or beginning byday1 and linked by that union; for a validated outpatient-only birth it may be empty, with birth_end=birth. Do not require an inpatient spell to enter. Missing end dates produce interval timing; no arbitrary end-of-study discharge. 3. Qualifying spells have a component with the conjunction(primary respiratory,acute,inpatient), start>=birth+28 days, and start>birth_end. Merge qualifying readmissions beginning 7 days after the previous qualifying spell ends into one infection episode. A pre-neonatal/birth-continuing spell does not become new merely because it spans-day28. A later new qualifying spell remains countable. A 30-day recurrence-gap variant probes prolonged illness. Record the initial-birth-exclusion count without declaring excluded days healthy. 4. At 1,3,5 birthdays create ever-event indicators among all births; known events before or on death date count, none later. Death before day 28 forces resp endpoints 0. Incomplete contact/timing coverage yields [0,1] for unsettled

occurrence. resp2plus5 and resp3plus5 indicate at least 2 and 3 separated episodes; retain a birth denominator, with no conditioning on first infection. 5. Create joint5 states: alive/no qualifying event, alive/ever event, dead/no prior event, dead/ever event, plus unknown-state mass. Also create death_or_resp5, which is 1 if either event is known before 5, 0 if both definitively absent, else [0,1]. Death reduction can increase recorded respiratory incidence by enabling survival; a respiratory increase alone is not harm from care. Report hospital-day context from atom-000005 without fitting mediation or survivor-average effects. 6. Estimate primary resp5 with $\pm .05/3$; other endpoints with 95% sets. Run fixed variants, historical resp5, gestation strata, secondary-diagnosis and 30-day episode variants, and the broader-health observation bounds. An admission is a combined morbidity/use outcome; it cannot establish biological infection incidence or efficiency of healthcare use.

Outputs: shared files; keys resp1, resp3, resp5, resp2plus5, resp3plus5, death_or_resp5; joint.csv(period, endpoint, horizon, state, n_lower, n_upper, denominator, status) with the five states above. For all joint categories provide bounds, not a mutually exclusive invented allocation of unknowns. Event-level records remain confidential. Figures 4/5/6; Tables S2–S6/S8; joint states in Table S9.

Synthetic checks: two transfer contacts form one spell; same patient/date diagnosis fan-out does not increase counts; onsetday27 with stay through day30 is not a new eligible episode; empty inpatient birth spell allowed for a validated outpatient birth; recurrence at 7-day gap merged and 8-day gap separated; respiratory diagnosis and acute flag must coexist on a component; death before BEF is retained in denominator; missing follow-up cannot become known disease absence; a death/event on one date has no invented within-day sequence.

Final Blueprint clarification (2026-09-09 UTC): the incorporated shared contracts include the dated optional-BES ascertainment distinction, sign-aware fitted envelopes and explicit aggregate metadata. Figure and table allocation is specified in docs/story/blueprint.md and docs/paper/figures.yaml; it introduces no new estimator, endpoint, subgroup, activation rule or local result state. All original scientific commitments remain in force. Figures 4 and 5 compare the three clinical domains at age five and at the already registered cumulative horizons; Figure 6 is the curvature sensitivity. Plot order does not create a computational dependency.

Remaining registration fields

The preregistration.protocol field is reproduced in full immediately above; all remaining fields are reproduced below.

```
id: atom-000007
topic: Respiratory consequences
atom_result: prereg
atom_strength: null
atom_shape: null
evidence_paths: []
concepts: []
literature: []
bonds: []
preregistration:
  version: 1
```

```

mode: adaptive
question: Does the care-recommendation contrast alter post-neonatal
  ↳ respiratory
    admissions and recurrence through age five?
rationale: Acute respiratory hospitalisation tests whether early care
  ↳ translates
    into later recorded illness burden. Timing, recurrence and
    ↳ death-or-admission
      comparisons distinguish persistence from the mechanical availability of
      children to be readmitted.
assumption: The dated2012 clinical recommendation can supply a local
  ↳ eligibility
    encouragement, conditional on the explicitly registered score, continuity,
    observation and curvature assumptions. Documentation alone does not
    ↳ establish
      realised validity.
target_strength: causal
target_shape: comparison
ratings:
  importance: 5
  novelty: 3
  feasibility: 3
  data_advantage: 4
  informativeness: 0.7
tables:
- LPR_ADM
- LPR_FOEDSLER
- LPR_DIAG
- BEF
- DODSAASG
activation: (state(atom-000004) == "ready") OR (state(atom-000004) ==
  ↳ "qualified")
verdicts:
- key: data_gap
  region: A required outcome table/period/field is demonstrably absent or
  the registered construct cannot be obtained from the allowed sources.
  says: This endpoint cannot be evaluated in the supplied boundary; no null
  or replacement association.
- key: unresolved
  region: Outcome timing, linkage or coding semantics required to calculate
  even the registered interval remain unverified.
  says: The endpoint remains unresolved; evidence is not negative.
- key: non_estimable
  region: The cohort is defined but fewer than two positive-weight mass
  points on a side or a rank-deficient design prevents the registered
  contrast.
  says: Report support; no estimated local effect and no bandwidth
  ↳ expansion.
- key: model_conflict
  region: The reference-M confidence set has empty intersection with the
  feasible effect range.
  says: The registered model/curvature specification conflicts with the
  realised evidence; no directional causal claim.
- key: sensitivity_limited
  region: The primary reference-M simultaneous interval excludes zero, but
  hospital-group sensitivity or any of h100, h150 and wider-gap variants
  is unavailable or contains zero, or any other registered specification
  has a 95% interval wholly in the opposite direction.
  says: A directional contrast is supported only under the named restricted

```

- assumptions/specification; explain the dependence or support
 → sensitivity.
- key: lower
 - region: The primary reference-M interval is wholly below zero and none of the preceding regions applies.
 - says: The lower-weight schedule has a lower endpoint under the registered causal, recording, curvature and dependence assumptions; not an isolated treatment effect.
- key: higher
 - region: The primary reference-M interval is wholly above zero and none of the preceding regions applies.
 - says: The lower-weight schedule has a higher endpoint under the registered assumptions; distinguish health, survival and recording channels.
- key: otherwise
 - region: otherwise
 - says: Direction remains unresolved, including intervals containing zero or spanning the whole feasible range. No equivalence or safety
 → conclusion.

Registered experiment

Acute respiratory hospitalisation tests whether early care translates into later recorded illness burden. Timing, recurrence and death-or-admission comparisons distinguish persistence from the mechanical availability of children to be readmitted. All empirical results are pending.

atom-000008: Neurological consequences

Shared normative specifications: docs/protocol/data-contract.md (all sections) and docs/protocol/statistical-analysis.md (all sections) are incorporated here, including exact fields, version-aware joins, date-valid SKS, birth-first cohort, assignment, fixed estimator, missing-outcome envelope, multiplicity, diagnostics, variants and output columns. docs/protocol/identification.md supplies the documented institution and unresolved facts. No observed values have been read. All status decisions are ordered first-match; an operational failure produces terminal no_result, never a scientific verdict. No outcome-based route selection is authorised.

Population/time: all infants in the fixed cohort from birth, without surviving to 29 days as an entry requirement. Primary endpoint neuro_epilepsy5 is a completed public somatic hospital contact with a date-valid DG40* diagnosis (A or B) by the fifth birthday. DG41* alone is not the primary epilepsy phenotype; a DG40-or-DG41 variant follows the broader external convention. neuro_cp5 is secondary hospital-recorded DG80*, not validated cerebral-palsy incidence, severity, functional ability or school readiness. Codes are checked at contact end and start, with historical label changes retained.

The clinically relevant comparison is **recorded diagnoses**, not prescription-treated epilepsy or a specialist disability-register phenotype. Sun et al.(2024) supplies the DG40–DG41 diagnosis precedent, but its ≥ 35 -week survivor cohort and treatment-receipt comparison are not imported. Its actual onset date cannot be recovered precisely from the allowed legacy contact fields. This protocol therefore uses

a conservative completed-contact definition rather than silently attributing a later diagnosis to an earlier visit.

Pseudocode: 1. Reduce DIAG to contact-level A/B diagnosis flags with valid prefixes. For inpatient contacts use their documented completion D_UDDTO as recording time. For outpatient contacts require at least one BES date within the contact and use completion D_UDDTO as recording time. No daily visit expansion. Contacts must start at/after birth and complete strictly before the relevant birthday. Contacts extending beyond a birthday are not retrospectively counted in the primary completed-contact endpoint at that birthday. This is a documented operationalisation, not an estimate of biological onset. 2. If completion dates are absent or cannot be distinguished from extract truncation, unsettled endpoints get[0,1]; an otherwise complete extract with no qualifying completed contact gives 0 for this recording target. An observed qualifying completed contact gives 1. Do not label a child with a coded ongoing contact as healthy: provide the onset-window sensitivity below. 3. Produce neuro_epilepsy1,3,5 and neuro_cp5; retain all-birth denominators. Known death fixes subsequent recording opportunity; events on the death date can count. Form death_or_epilepsy5 and death_or_cp5 with OR bounds. Joint5 states match the respiratory Atom (alive/dead×ever/not, plus unknown) for each diagnosis. For absent vital evidence, retain possible states and interval mass. 4. Diagnostic-timing sensitivity: for every diagnosis-bearing contact let possible recording date span[start,end], with actual BES dates providing possible outpatient attendance but not diagnosis timing. If start<horizon end, an unconfirmed prior event produces [0,1]. If end<horizon it is known by the horizon. For contacts beginning before birth or inconsistent with lifespan, do not guess. Report these onset-window envelopes separately from the primary completed-contact target. No additional assumption of instantaneous diagnosis at admission. 5. Estimate neuro_epilepsy5 with =.05/3; other outcomes and variants 95%. Apply fixed score/curvature/dependence variants, the historical neuro_epilepsy5 comparison and gestation strata. The wider DG40-or-DG41 definition and timing envelope are prespecified sensitivities. DG80 is an ascertainment-limited secondary recording outcome; no “disability prevention” conclusion from a lower code rate alone. 6. Interpret alongside care/outpatient use and mortality. Higher coding with increased follow-up may reflect detection; fewer recorded diagnoses with higher mortality cannot imply healthier survivors. Concordant death-or-diagnosis and survival patterns can challenge a pure survival-selection account but still cannot separate prevention from altered recording. Never condition the main estimate on attending follow-up, neonatal diagnosis or receiving phototherapy.

Outputs: shared files; endpoint keys neuro_epilepsy1, neuro_epilepsy3, neuro_epilepsy5, neuro_cp5, death_joint.csv as atom-000007 with endpoint labels. Table S2 supplies complete code/timing definitions; Figures 4/5/6 and Tables S3–S6/S8/S9 carry estimates and limitations.

Synthetic checks: DG41-only does not enter the primary but enters the declared variant; future-completed contact is not backdated to an early visit; an outpatient opening without a real BES visit is insufficient; repeated A/B codes do not multiply children; contacts after death rejected; birthday boundary exact; death before first BEF retained; unknown completion gives bounds, not imputed healthy status; CP codes do not imply a validated functional-disability measure.

Final Blueprint clarification (2026-09-09 UTC): the incorporated shared contracts include the dated optional-BES ascertainment distinction, sign-aware fitted envelopes and explicit aggregate metadata. Figure and table allocation is specified in docs/story/blueprint.md and docs/paper/figures.yaml; it introduces no new estimator, endpoint, subgroup, activation rule or local result state. All original scientific commitments remain in force. Figures 4 and 5 compare the three clinical domains at age five and at the already registered cumulative horizons; Figure 6 is the curvature sensitivity. Plot order does not create a computational dependency.

Ascertainment clarification: primary outpatient DG40/DG80 recording remains BES-supported and completed. The existing neuro_timing comparison uses every diagnosis-bearing contact, including a completed acute type-2 contact without BES after the 2014 change. Completion strictly before the horizon establishes recording for this sensitivity only; a horizon-straddling contact remains interval-valued. This sensitivity jointly relaxes timing and BES support, so no difference may be called a pure diagnostic-delay effect. Synthetic counterexample: complete 2014 acute contact with DG40, valid dates and no BES, no other qualifying record: primary completed/BES predicate 0, neuro_timing 1 after completion; before completion but after start the sensitivity is [0,1]. No claim of biological onset or all-attendance ascertainment.

Remaining registration fields

The preregistration.protocol field is reproduced in full immediately above; all remaining fields are reproduced below.

```
id: atom-000008
topic: Neurological consequences
atom_result: prereg
atom_strength: null
atom_shape: null
evidence_paths: []
concepts: []
literature: []
bonds: []
preregistration:
  version: 1
  mode: adaptive
  question: Does the eligibility contrast change hospital-recorded
    ↪ neurological
      morbidity by age five?
  rationale: Persistent neurological recording complements survival and acute
    respiratory use, while explicitly separating diagnoses from underlying
    disability and from surveillance induced by care.
  assumption: The dated2012 clinical recommendation can supply a local
    ↪ eligibility
      encouragement, conditional on the explicitly registered score, continuity,
      observation and curvature assumptions. Documentation alone does not
      ↪ establish
        realised validity.
  target_strength: causal
  target_shape: comparison
ratings:
  importance: 5
  novelty: 3
```

```

feasibility: 3
data_advantage: 4
informativeness: 0.7
tables:
- LPR_ADM
- LPR_FOEDSLER
- LPR_DIAG
- LPR_BES
- BEF
- DODSAASG
activation: (state(atom-000004) == "ready") OR (state(atom-000004) ==
↳ "qualified")
verdicts:
- key: data_gap
  region: A required outcome table/period/field is demonstrably absent or
  the registered construct cannot be obtained from the allowed sources.
  says: This endpoint cannot be evaluated in the supplied boundary; no null
  or replacement association.
- key: unresolved
  region: Outcome timing, linkage or coding semantics required to calculate
  even the registered interval remain unverified.
  says: The endpoint remains unresolved; evidence is not negative.
- key: non_estimable
  region: The cohort is defined but fewer than two positive-weight mass
  points on a side or a rank-deficient design prevents the registered
  contrast.
  says: Report support; no estimated local effect and no bandwidth
  ↳ expansion.
- key: model_conflict
  region: The reference-M confidence set has empty intersection with the
  feasible effect range.
  says: The registered model/curvature specification conflicts with the
  realised evidence; no directional causal claim.
- key: sensitivity_limited
  region: The primary reference-M simultaneous interval excludes zero, but
  hospital-group sensitivity or any of h100, h150 and wider-gap variants
  is unavailable or contains zero, or any other registered specification
  has a 95% interval wholly in the opposite direction.
  says: A directional contrast is supported only under the named restricted
  assumptions/specification; explain the dependence or support
  ↳ sensitivity.
- key: lower
  region: The primary reference-M interval is wholly below zero and none
  of the preceding regions applies.
  says: The lower-weight schedule has a lower endpoint under the registered
  causal, recording, curvature and dependence assumptions; not an isolated
  treatment effect.
- key: higher
  region: The primary reference-M interval is wholly above zero and none
  of the preceding regions applies.
  says: The lower-weight schedule has a higher endpoint under the registered
  assumptions; distinguish health, survival and recording channels.
- key: otherwise
  region: otherwise
  says: Direction remains unresolved, including intervals containing zero
  or spanning the whole feasible range. No equivalence or safety
  ↳ conclusion.

```

Registered experiment

Persistent neurological recording complements survival and acute respiratory use, while explicitly separating diagnoses from underlying disability and from surveillance induced by care. All empirical results are pending.