

— HARM BLINDNESS · CHILDREN'S ENVIRONMENTAL HEALTH · HISTORY OF CHILDHOOD · CHILDHOOD STUDIES · SENTINEL POPULATIONS · HUMAN SUBJECTS RESEARCH ETHICS · VULNERABLE POPULATIONS · ENVIRONMENTAL JUSTICE · CHILDISM · DEVELOPMENTAL VULNERABILITY · LEAD EXPOSURE · RESIDENTIAL SCHOOLS · PLATFORM ACCOUNTABILITY

Children as Canaries

Disaggregating the sentinel claim into three mechanisms of early harm

A canary detects a hazard aimed at no one. Most children called canaries were aimed at, or could not leave.



Children as Canaries: Disaggregating the Sentinel Claim into Three Mechanisms of Early Harm. Working paper, July 2026 (v2).

Travis Gilly · Real Safety AI Foundation

THE CANARY

A good metaphor, and a bad one

The canary earns the image. A smaller body with a faster metabolism registers a poison before a larger body does, and the bird's distress is real information about the air the miners are breathing.

It also fails the image, because the miners put the bird in the cage on purpose. The metaphor smuggles in a choice that most of the cases it gets applied to never had, and it blurs the line between a bird that detected a hazard and a bird that was fed to one.

That ambiguity is free in casual talk. It gets expensive the moment the claim is asked to do analytical work, because it invites an easy rebuttal that takes the surrounding argument down with it.

THE CLAIM

One metaphor is hiding three different harms

Calling children canaries works only when it means one thing. A hazard shows up in children first because their bodies register it sooner, the early signal is a warning, and the adults failed to read it. That happens, it repeats, and it deserves a precise name.

The same phrase then gets stretched over two other patterns that look similar and are not. In one, children were chosen because they were children. In the other, children simply could not leave.

Only the first is a sentinel effect. The other two are childism, and telling the three apart is the contribution of this paper, because each one calls for a different remedy.

THE DISAGGREGATION

One metaphor, three different harms

I

Sentinel proper

HARM SHOWS IN CHILDREN FIRST

The child's smaller, faster-developing body reads a shared poison before the adult body does. The early signal is real information about the exposure.

II

Targeted selection

CHILDREN WERE CHOSEN

Nothing about a child's body explains the harm. Children were taken because they were powerless, available, and easier to shape before they were formed.

III

Captive absorption

CHILDREN COULD NOT LEAVE

The exposure is ambient and children absorb a larger share, but the mechanism is captivity, not detection. The child is a resident of a place the adults could leave.

THE SENTINEL CLAIM, STATED CAREFULLY

Why a child's body reads a poison first

A sentinel population is one where a hazard becomes detectable earlier, or at a lower dose, because something about that group amplifies the signal.

For children the amplifiers are well documented. They take in more relative to their size, absorb more through the gut, carry a blood-brain barrier that is not finished, pass through developmental windows where a small insult leaves a permanent mark, and have a longer life ahead of them for a hidden effect to surface.

That is a claim about the order of detection, and it can be proven wrong. If a poison enters the shared air, water, or milk, the effect is measurable in children before adults and at lower doses. That, and only that, is the sentinel effect.

Sentinel proper

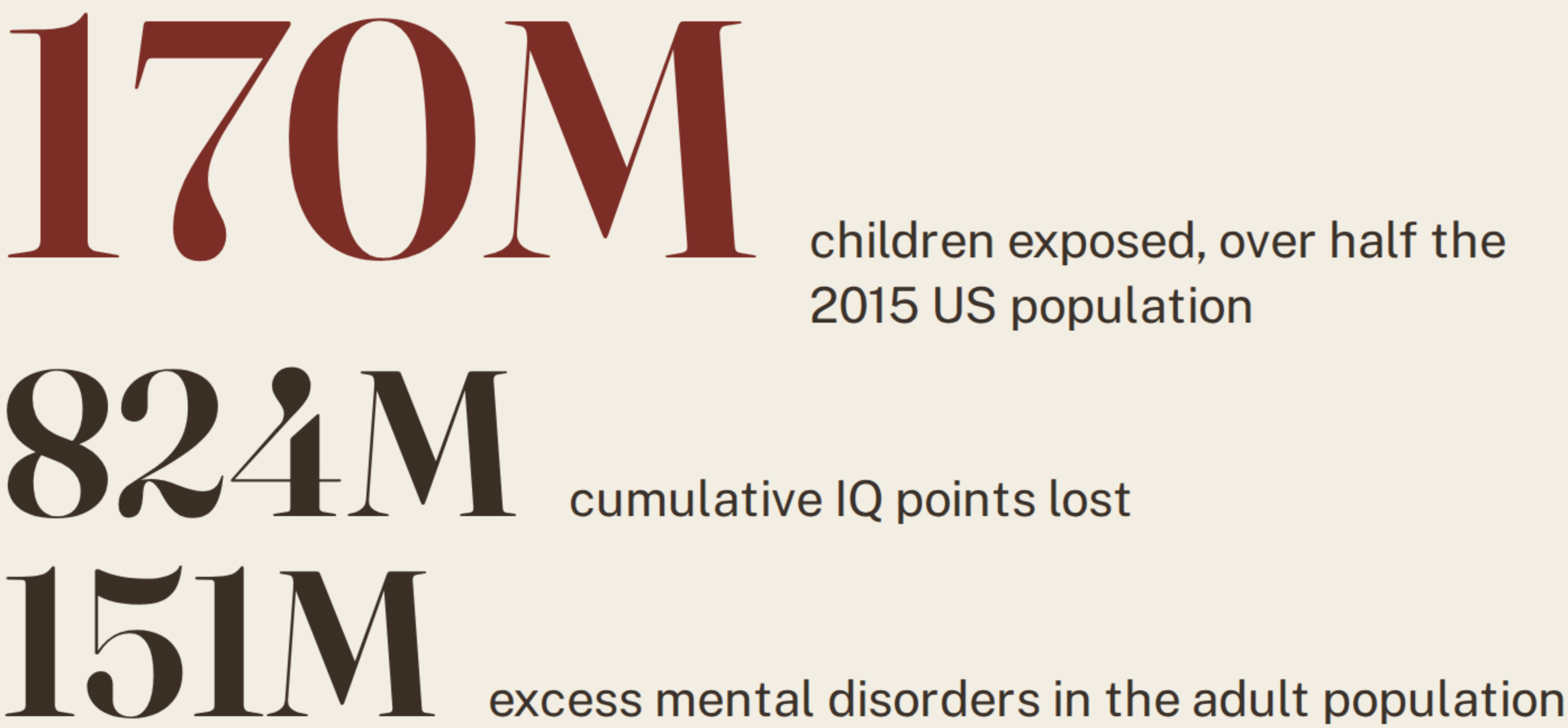
Harm the children read first



The one case where calling children canaries is correct: the signal was legible, and it was not used.

THE PARADIGM CASE

Leaded gasoline, the sentinel effect as a measured finding



Lead went into gasoline in the 1920s to stop engine knock, after the men who made it were already being poisoned. Clinical lead poisoning in children was in the medical literature by 1904, and subclinical damage in children was reported through the 1970s on streets where adults breathed the same air. The pediatric signal was legible while the adult signal was not. The adult accounting arrived decades later, and it was measured against that childhood exposure. The authors state the estimate assumes the lead-to-psychopathology link is causal, and that caveat travels with the number.

THE ACTUAL ANIMAL SENTINEL

London, 1952, and a warning nobody read

A five-day smog killed about 4,000 people at once and roughly 12,000 in total, once later analysis reassigned deaths first blamed on influenza. The record keeps a detail the metaphor's users miss: prize cattle brought into the city for an agricultural show sickened, and some had to be destroyed, before the human toll was counted.

An actual animal sentinel appears in the paradigm human case, and it worked exactly as promised. The deaths fell on the very young and the very old while working-age adults breathing the same air survived, which is the tell. A lens that only ever finds children is not detecting, it is projecting.

And the influenza story was not waved away. Someone did the arithmetic on it, by several independent methods, and it failed.

THE PATHWAY WAS MILK

Fallout that concentrated in children, through the milk they drank

From 1951, atmospheric bomb tests at the Nevada Test Site sent fallout across Nevada, Utah, Arizona, and neighboring states. Reconstruction studies found that milk was the main exposure route, and that children who drank fresh local milk carried the highest thyroid doses, because iodine-131 concentrates in a child's thyroid.

Officials publicly minimized the hazard while the tests continued, and the reassurance did not match what was understood internally. Same structure as lead: the child's body read the dose first, and the reassurance outran the science.

Targeted selection

Children chosen because they were children

Not a dose story. A decision, and the belief that licensed it. This is childism, and it is better grounded under that name.

SELECTION AS A SYSTEM

When the child is the raw material

The Ottoman devshirme took roughly 200,000 boys, converted and trained to serve the state. The Mamluk system went further and excluded its own elite's sons, so it had to keep buying children, because a purchased child had no rival loyalties and a person can be shaped before they are formed.

Nothing about pediatric physiology is in the explanation. The children were taken because they were legally powerless and institutionally available, and because their unformed selves were treated as a resource. Calling them canaries reverses the moral structure. A canary detects a hazard aimed at no one. These children were aimed at.

SELECTION AS ASSIMILATION

Systems built to take children and remake them

More than 150,000 children passed through Canada's residential schools and at least 4,200 died, with parallel systems in the United States and Australia. The aim was to remove a child from a culture and overwrite it, which only works on someone not yet formed.

The death counts are floors, limited by the records the institutions chose to keep, and their distance from the true number is unknown. A number that measures somebody's diligence is not a number to draw confidence from, and this paper marks it as a floor rather than a count.

THE DECISIVE CASE

Fernald settles it: this is not a dose story

At Willowbrook, institutionalized children were deliberately infected with hepatitis. At the Fernald school, boys were fed radioactive isotopes in their breakfast cereal as part of a study.

Here is the point no sentinel case can make. A federal advisory committee later found the Fernald radiation doses unlikely to have caused physical injury, and concluded the studies wronged the boys anyway.

If the harm survives a finding of no physical injury, the mechanism is not detection. The wrong was the selection and the use of a captive child. That is childism, and the dose is beside the point.

THE RIGHT NAME FOR IT

A prejudice with its own structure, not an accident of convenience

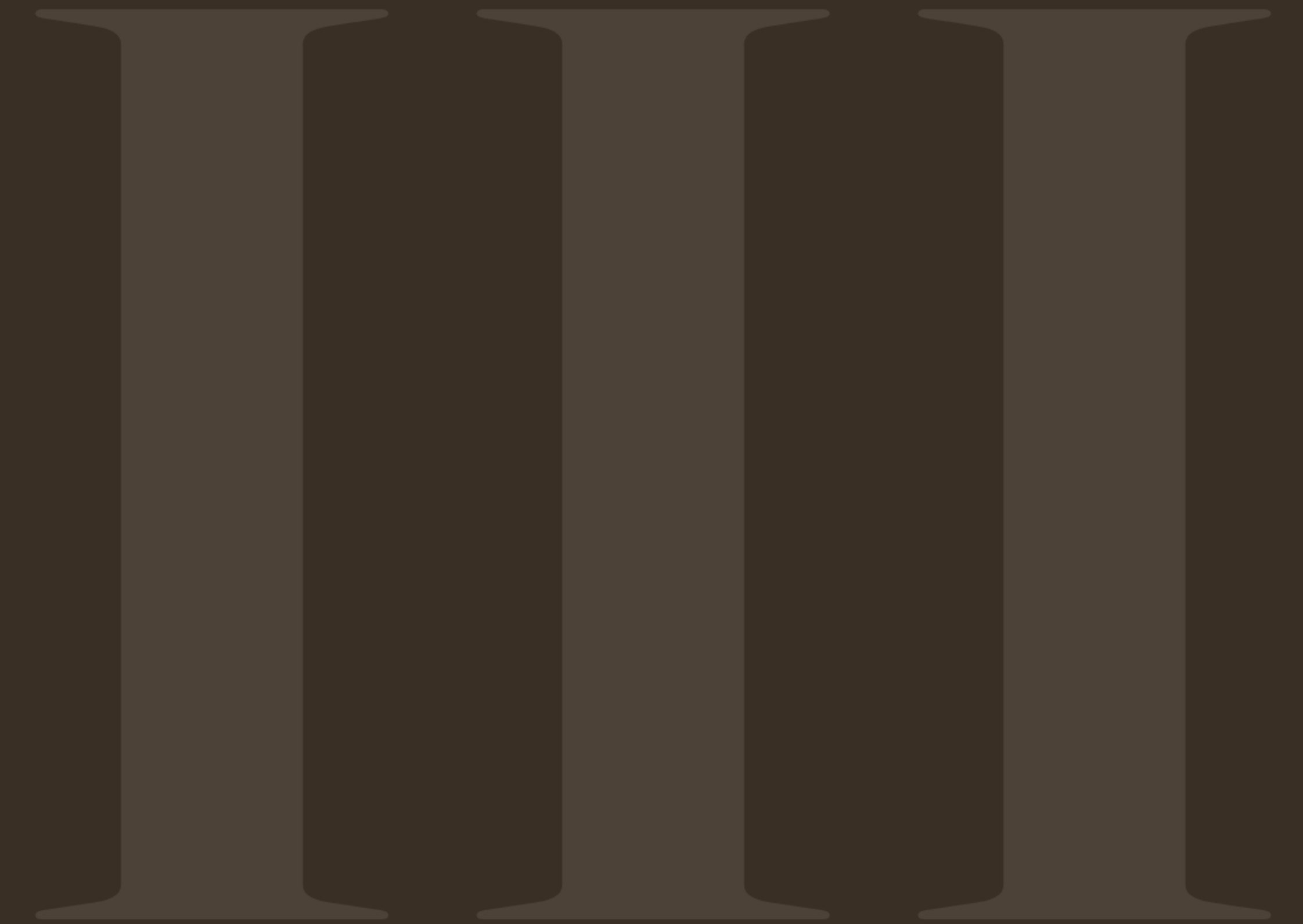
The pattern has a name. Childism is the prejudice that rationalizes harming children on the belief that they are property, to be controlled or removed to serve adult needs. That is not an analogy for the devshirme and the residential schools. It is an inventory of them.

Recent philosophy sharpens it. Childhood is a social category whose definition itself decides how those inside it may be treated, and the asymmetry survives kind treatment, because a well-treated child still depends on adult will to grant the kindness.

Being used to benefit those in power is the mechanism in five words, arrived at independently in the developmental literature. It is also why the record holds so few villains and so many committees.

Captive absorption

Children who could not leave



Most often mistaken for the first, because the epidemiology looks the same. The explanation is location.

THE CLEAN DEMONSTRATION

Aberfan: a child death count that carries no information about susceptibility

On a Friday morning in October 1966, a saturated colliery tip slid onto Pantglas Junior School. It killed 144 people, 116 of them children, most between seven and ten. Roughly half the village's children died.

Nothing about a seven-year-old's body made that child more vulnerable to a landslide than an adult. They died because of a timetable, in a building attendance at which was compulsory, beneath a hazard their parents had reported for years and could not remove.

The springs under the tip had been marked on the maps since 1874. This is captivity with no dose in it at all.

THE MECHANISM IS LOCATION

The child absorbs a larger share because the child cannot leave

Asbestos sat in roughly 34,800 schools. Lead sits in public housing. Flint reached children through the tap. Children show up disproportionately in the exposure counts, which looks like a sentinel signal and is not.

The explanation is that the law, the lease, and the utility put the child in the place and kept them there. The exposure is ambient, and the child is simply the resident who cannot leave.

That is why the remedy runs to the hazard rather than to the child. The child is the one party who cannot be removed, so the hazard has to be.

THE DISCIPLINE THAT MAKES IT WORK

A model that claims everything is the disease, not the cure

Run the questions on a vivid case that fails them. The 737 MAX crashes killed 346 people, but children were not chosen, no property of childhood made the harm land on them first, and a plane is not a place children occupy disproportionately. It fails all three, and the correct output is to leave it out.

Two standing temptations get refused the same way. A high child exposure count is not a sentinel signal: asbestos exposed 15 million children and the disease surfaced in the maintenance workers. And child labor is not children detecting an economic harm early. Those children were the labor, and the harm was the same harm in a smaller body.

THE HISTORICAL RHYME

When everyone can see the children and the obstacle is doctrine

Congress limited child labor in 1916. The Supreme Court struck it down in 1918. Durable federal limits waited until 1938, and the Court reversed its own reasoning in 1941.

Twenty-five years between the first attempt and the lasting one, and the obstacle was doctrine, not evidence. The photographs existed. Everyone could see the children.

That interval is the rhyme with the section that ends this paper, where the barrier is again a rule rather than a lack of proof.

The digital record

The mechanisms carry forward, and the assignment works

IV

The field's habit is to call all of it one thing. That is the same error that produced the canary confusion in the first place.

CAPTIVITY, GEOMETRY ROTATED

The platform performed the pairing

Omegle matched strangers in one-to-one video, no sign-up, users labeled only You, Stranger 1, and Stranger 2, with no restriction on children. A child could close the browser, so the captivity was not spatial.

What the child could not do was choose or even see the counterparty, because the platform made the match. That is captive absorption with the geometry turned: the constraint is on the choice, not the exit.

A court let a product-design claim proceed, treating the duty to design a safe product as independent of publishing third-party content. Omegle shut down in 2023 under pressure, and no court ever ruled on whether the pairing design was defective.

TARGETING, AND A REPORTING FAILURE

Reward loops aimed at a developmental stage, and a remedy that answered “no violation found”

TARGETING

The game and platform cases allege mechanics borrowed from gambling, tuned by the company's own telemetry to the young users most likely to use them compulsively. Reported internal research found that among teen girls who already felt bad about their bodies, 32 percent said Instagram made it worse. The companion-chatbot cases are the newest and closest to the old pattern, because the product simulates a relationship; a court let key claims proceed in 2025, and the deaths in the record remain allegations, not findings of causation.

THE REPORTING FAILURE

A minor proved his age and reported his own abuse material through the mechanism built for exactly that. An automated review told him it found no policy violation. The videos came down about a week later, only after a federal agent stepped in. Whatever else the child-safety apparatus is, it is not a system that failed to be told.

The door does not open from their side

The most important finding in the paper



The historical record and the contemporary record converge on one thing, and it decides what happens next.

THE DEFINITIONAL EXCLUSION

The remedy drawn narrower than the harm, by the same hand that caused it

7,600 people sterilized in North Carolina

\$10M reserved for compensation in 2013

<220 ever certified and paid

Eligibility was limited to operations authorized by the Eugenics Board itself, so people sterilized under county or institutional authority fell outside it and received nothing. The gap between 7,600 and 220 is not a funding failure. It is a definitional one, and the state drew it. The redress literature has a name for this: the trade-offs are built into the tools used to assess historic claims, which is why programs in Australia, Canada, Ireland, and Sweden draw the same criticism regardless of who runs them.

THE PATTERN REPEATS, EACH ON A DIFFERENT TECHNICALITY

When the statute works and the outcome does not change

Nevada downwinders waited until 1990 and were told for decades they lived outside the line. The Guatemala claim was dismissed on sovereign immunity. The Magdalene orders that profited from the labor contributed little to redress. Flint's prosecutions were largely unwound on procedure.

Camp Lejeune is the asymmetry at its largest measured scale. Congress removed the barriers in 2022, more than 400,000 claims were filed, and by mid-2026 fewer than one percent of claimants had been paid. The barrier moved from doctrine to throughput, and the outcome did not change, because a large share of those affected are elderly or already dead.

A remedy that arrives after the claimant does not is not a remedy. It is an accounting entry.

THE BARRIER IS GENERAL

The reflex says the law fails children; the law does not single them out

The same platform immunity that defeats a child's claim operates identically on an adult defrauded by an advertisement they were shown. The barrier was not built to exclude children and does not select for them.

A system that makes compensation depend on finding and beating a responsible party does not fall evenly, and its search for justice can end by leaving the most disadvantaged with nothing. The mechanism is neutral on its face and regressive in operation, and the neutrality is what makes it durable.

Section 230 is definitional, not merely procedural. A defendant classified as infrastructure has been placed outside the category of things that answer.

WHY A CHILD-SPECIFIC FIX MISSES

A general barrier has no child-shaped piece to remove

The statute the field reaches for proves the problem. The Children's Online Privacy Protection Act reaches only children under 13 and requires the platform to have actual knowledge that children use it, so a platform's own ignorance becomes the condition of its protection.

Both limits are definitional, and they were drafted by the party that would otherwise pay. A child-specific barrier yields to a child-specific statute. A general barrier that falls hardest on those least able to route around it does not.

North Carolina is the proof. The eligibility line that excluded most of the sterilized was not aimed at them either. It was drawn for administrative convenience, and the effect was the same as malice would have been.

THE ONE ROUTE THE RECORD SUPPORTS

A remedy that does not require each child to prove their own case

One line of scholarship cuts toward optimism. Attorneys general in more than forty states, across the political spectrum, have brought actions against social media companies, alongside a consolidated federal case and suits by school districts and tribal nations.

The closest precedents, tobacco and opioids, produced not only payouts but changes to marketing rules, age and access restrictions, and better documentation of harm. If that reading holds, remediation need not run through compensating individuals one by one, which is exactly where every mechanism here predicts it will fail.

The countervailing fact is on the record too. Firms have cut trust-and-safety capacity and restricted outside oversight even as the litigation has grown. This paper takes no side on which tendency prevails.

THE HONEST LIMITS

What this argument does not claim

- 1 The sentinel case is retrospective.** Lead is legible now because the adult burden arrived and could be measured against childhood exposure. That method does not run forward, so any present-day sentinel claim is a prediction, and this paper offers no procedure to validate one.
- 2 The population lead estimates carry a stated assumption.** They assume the lead-to-psychopathology link is causal, and low-exposure evidence is mixed once maternal factors are controlled.
- 3 The pattern is a pattern, not a law.** Harms attached to adult roles produce no early signal in children, and none should be sought. A lens that only ever finds children is not detecting anything.
- 4 Several historical figures are estimates, not counts.** They are marked as such rather than laundered into precision.
- 5 The targeting counts are floors set by investigative effort.** So the paper claims the structure of mechanism two, not its magnitude.

WHAT THE DISAGGREGATION IS FOR

Three cases, three arguments an advocate must not confuse

<i>Sentinel case</i>	the argument is surveillance, and the interval in which a known signal went unused.
<i>Targeting case</i>	the argument is the selection and the belief that licensed it; the dose is beside the point.
<i>Captivity case</i>	the argument is the hazard's presence where attendance is compulsory, and the remedy runs to the hazard, because the child cannot be removed.

Fernald settles the targeting case, because the harm survived a finding of no injury. Aberfan settles the captivity case, because nothing about the children's bodies enters the explanation at any point.

THE CHILDREN ARE SIMPLY IN THE ROOM

The barriers were not built for children

7,600 people sterilized in North Carolina

< 220 ever certified and paid

The eligibility line was drawn for administrative convenience, and most of the sterilized fell outside it. The same shape defeats child plaintiffs now. The barrier is general, so there is no child-shaped piece to remove. Section 230 was drawn for a different purpose, and children fall outside it too.

NEWARK, THE REASON TO THINK IT MOVES

23,000 lead service lines replaced in under three years, by paying for the private half of the pipe. What every other city calls structural was a line item. Captivity is a policy setting with a dial.

References — Scholarship (1 of 6)

Children as Canaries: Disaggregating the Sentinel Claim into Three Mechanisms of Early Harm. Working paper, July 2026 (v2).

Beecher, H. K. (1966). Ethics and clinical research. *New England Journal of Medicine*, 274(24), 1354–1360. <https://doi.org/10.1056/NEJM196606162742405>

Bell, M. L., Davis, D. L., and Fletcher, T. (2004). A retrospective assessment of mortality from the London smog episode of 1952: The role of influenza and pollution. *Environmental Health Perspectives*, 112(1), 6–8. <https://doi.org/10.1289/ehp.6539>

Ben-Porath, S. R. (2003). Autonomy and vulnerability: On just relations between adults and children. *Journal of Philosophy of Education*, 37(1), 127–145. <https://doi.org/10.1111/1467-9752.3701009>

Bhatia, A., Krieger, N., and Subramanian, S. V. (2019). Learning from history about reducing infant mortality: Contrasting the centrality of structural interventions to early 20th-century successes in the United States to their neglect in current global initiatives. *The Milbank Quarterly*, 97(1), 285–345. <https://doi.org/10.1111/1468-0009.12376>

Brodie, B. (1991). Baby's milk: A source of trust between mothers and nurses. *Public Health Nursing*, 8(3), 161–165. <https://doi.org/10.1111/j.1525-1446.1991.tb00749.x>

Black, L., and Ring, S. (2022). Historical gendered institutional violence: A research agenda for criminologists. *Journal of Contemporary Criminal Justice*, 39(1), 17–37. <https://doi.org/10.1177/10439862221138669>

Bommarito, P. A., and Fry, R. C. (2016). Developmental windows of susceptibility to inorganic arsenic: A survey of current toxicologic and epidemiologic data. *Toxicology Research*, 5(6), 1503–1511. <https://doi.org/10.1039/c6tx00234j>

Bossio, D., Flew, T., and Meese, J. (2022). Australia's News Media Bargaining Code and the global turn towards platform regulation. *Policy and Internet*, 14(1), 136–150. <https://doi.org/10.1002/poi3.284>

Brady, J. P. (2012). Marketing breast milk substitutes: Problems and perils throughout the world. *Archives of Disease in Childhood*, 97(6), 529–532. <https://doi.org/10.1136/archdischild-2011-301299>

Brando, N. (2022). The moral relevance of social categories: Analysing the case of childhood. *European Journal of Philosophy*, 31(1), 195–208. <https://doi.org/10.1111/ejop.12780>

Burman, E. (2022). Child as method and/as childism: Conceptual-political intersections and tensions. *Children and Society*, 37(4), 1021–1036. <https://doi.org/10.1111/chso.12615>

References — Scholarship (2 of 6)

Capron, A. M. (2017). Building the next bioethics commission. *Hastings Center Report*, 47(S1), S4–S9. <https://doi.org/10.1002/hast.710>

Carroll, A. E., and Cheng, E. R. (2020). Vaping and youth — first, do no harm. *JAMA Pediatrics*, 174(7), 645. <https://doi.org/10.1001/jamapediatrics.2020.0277>

Chatters, L. M., Taylor, R. J., and Schulz, A. J. (2022). The return of race science and why it matters for family science. *Journal of Family Theory and Review*, 14(3), 442–462. <https://doi.org/10.1111/jftr.12472>

Chrostowski, P. C., Foster, S., and Anderson, E. (1991). Human health risks associated with asbestos abatement. *Risk Analysis*, 11(3), 465–481. <https://doi.org/10.1111/j.1539-6924.1991.tb00632.x>

Claus Henn, B., Austin, C., and Coull, B. A. (2018). Uncovering neurodevelopmental windows of susceptibility to manganese exposure using dentine microspatial analyses. *Environmental Research*, 161, 588–598. <https://doi.org/10.1016/j.envres.2017.12.003>

Daly, K. (2025). Justice: Word, idea, practice. *Criminology*, 63(4), 707–743. <https://doi.org/10.1111/1745-9125.70009>

Davis, K. M. (2016). False assurances: The effects of corrosive drinking water and noncompliance with lead control policies in Flint, Michigan. *Environmental Justice*, 9(4), 103–108. <https://doi.org/10.1089/env.2016.0009>

Drozdovitch, V. (2021). Radiation exposure to the thyroid after the Chernobyl accident. *Frontiers in Endocrinology*, 11, 569041. <https://doi.org/10.3389/fendo.2020.569041>

Faden, R. (1996). The Advisory Committee on Human Radiation Experiments. *Hastings Center Report*, 26(5), 5–10. <https://doi.org/10.2307/3528463>

Fadus, M. C., Smith, T. T., and Squeglia, L. M. (2019). The rise of e-cigarettes, pod mod devices, and JUUL among youth: Factors influencing use, health implications, and downstream effects. *Drug and Alcohol Dependence*, 201, 85–93. <https://doi.org/10.1016/j.drugalcdep.2019.04.011>

Farrell, A., and Devaney, S. (2007). Making amends or making things worse? Clinical negligence reform and patient redress in England. *Legal Studies*, 27(4), 630–648. <https://doi.org/10.1111/j.1748-121X.2007.00061.x>

References — Scholarship (3 of 6)

Feir, D. (2016). The long-term effects of forcible assimilation policy: The case of Indian boarding schools. *Canadian Journal of Economics*, 49(2), 433–480. <https://doi.org/10.1111/caje.12203>

Gallen, J. (2020). Transitional justice and Ireland's legacy of historical abuse. *Éire-Ireland*, 55(1–2), 35–67. <https://doi.org/10.1353/eir.2020.0002>

Gubernot, D. M., Boyer, B. L., and Moses, M. S. (2008). Animals as early detectors of bioevents: Veterinary tools and a framework for animal-human integrated zoonotic disease surveillance. *Public Health Reports*, 123(3), 300–315. <https://doi.org/10.1177/003335490812300310>

Hanna-Attisha, M., LaChance, J., and Sadler, R. C. (2016). Elevated blood lead levels in children associated with the Flint drinking water crisis: A spatial analysis of risk and public health response. *American Journal of Public Health*, 106(2), 283–290. <https://doi.org/10.2105/AJPH.2015.303003>

Ingber, A. S., and Su, C. C. (2024). Protecting children of the TikTok era: A discourse analysis in the absence of law. *Policy and Internet*, 17(2). <https://doi.org/10.1002/poi3.431>

Jones, M. (2024). The intergenerational legacy of Indian residential schools. *Demography*, 61(6), 1871–1895. <https://doi.org/10.1215/00703370-11679677>

Kirmizialtin, S. (2007). Conversion in Ottoman Balkans: A historiographical survey. *History Compass*, 5(2), 646–657. <https://doi.org/10.1111/j.1478-0542.2007.00420.x>

Laventhal, N., Tarini, B. A., and Lantos, J. D. (2012). Ethical issues in neonatal and pediatric clinical trials. *Pediatric Clinics of North America*, 59(5), 1205–1220. <https://doi.org/10.1016/j.pcl.2012.07.007>

Lee, H., Lee, M., and Warren, J. R. (2022). Childhood lead exposure is associated with lower cognitive functioning at older ages. *Science Advances*, 8(45). <https://doi.org/10.1126/sciadv.abn5164>

Lee, S., Rees, V. W., and Yossefy, N. (2020). Youth and young adult use of pod-based electronic cigarettes from 2015 to 2019: A systematic review. *JAMA Pediatrics*, 174(7), 714. <https://doi.org/10.1001/jamapediatrics.2020.0259>

Liu, S. H., Bobb, J. F., and Lee, K. H. (2017). Lagged kernel machine regression for identifying time windows of susceptibility to exposures of complex mixtures. *Biostatistics*, 19(3), 325–341. <https://doi.org/10.1093/biostatistics/kxx036>

References — Scholarship (4 of 6)

Lubin, N., Liu, Y., and Yarnell, A. (2025). Social media harm abatement: Mechanisms for transparent public health assessment. *Annals of the New York Academy of Sciences*, 1549(1), 171–184. <https://doi.org/10.1111/nyas.15345>

Lutter, C., Hernández-Cordero, S., and Grummer-Strawn, L. M. (2022). Violations of the International Code of Marketing of Breast-milk Substitutes: A multi-country analysis. *BMC Public Health*, 22(1). <https://doi.org/10.1186/s12889-022-14503-z>

Maslia, M. L., Aral, M. M., and Ruckart, P. Z. (2016). Reconstructing historical VOC concentrations in drinking water for epidemiological studies at a U.S. military base: Summary of results. *Water*, 8(10), 449. <https://doi.org/10.3390/w8100449>

McFarland, M. J., and Reuben, A. (2024). Contribution of childhood lead exposure to psychopathology in the US population over the past 75 years. *Journal of Child Psychology and Psychiatry*, 66(5), 659–666. <https://doi.org/10.1111/jcpp.14072>

McFarland, M. J., Hauer, M. E., and Reuben, A. (2022). Half of US population exposed to adverse lead levels in early childhood. *Proceedings of the National Academy of Sciences*, 119(11). <https://doi.org/10.1073/pnas.2118631119>

McNair, D. M. (2010). Historical and psychological origins of child soldiering in Ba`athist Iraq. *Digest of Middle East Studies*, 19(1), 37–48. <https://doi.org/10.1111/j.1949-3606.2010.00004.x>

Papayannis, D. M. (2023). The morality of compensation through tort law. *Ratio Juris*, 36(1), 3–25. <https://doi.org/10.1111/raju.12369>

Pickering, E. V., Fu, X., and Melaram, R. (2026). Groundwater chemistry and children's blood lead levels: A county-wise analysis in the United States. *GeoHealth*, 10(1). <https://doi.org/10.1029/2025GH001670>

Pilsner, J. R., Parker, M., and Sergeyev, O. (2017). Spermatogenesis disruption by dioxins: Epigenetic reprograming and windows of susceptibility. *Reproductive Toxicology*, 69, 221–229. <https://doi.org/10.1016/j.reprotox.2017.03.002>

Rabinowitz, P., Gordon, Z., and Holmes, R. (2005). Animals as sentinels of human environmental health hazards: An evidence-based analysis. *EcoHealth*, 2(1), 26–37. <https://doi.org/10.1007/s10393-004-0151-1>

Reif, J. S. (2011). Animal sentinels for environmental and public health. *Public Health Reports*, 126(1_suppl), 50–57. <https://doi.org/10.1177/00333549111260S108>

References — Scholarship (5 of 6)

Reiners, C. (2011). Clinical experiences with radiation induced thyroid cancer after Chernobyl. *Genes*, 2(2), 374–383. <https://doi.org/10.3390/genes2020374>

Rothman, D. J. (1982). Were Tuskegee and Willowbrook `studies in nature'? *Hastings Center Report*, 12(2), 5. <https://doi.org/10.2307/3561798>

Ruckart, P. Z., Bove, F. J., and Maslia, M. (2013). Evaluation of exposure to contaminated drinking water and specific birth defects and childhood cancers at Marine Corps Base Camp Lejeune, North Carolina: A case-control study. *Environmental Health*, 12(1), 104. <https://doi.org/10.1186/1476-069X-12-104>

Savage, L. (2023). Corporal punishment: Why the intentional use of violence against children is still acceptable. *Australian Journal of Social Issues*, 59(3), 667–675. <https://doi.org/10.1002/ajs4.274>

Schwaba, T., Bleidorn, W., and Hopwood, C. J. (2021). The impact of childhood lead exposure on adult personality: Evidence from the United States, Europe, and a large-scale natural experiment. *Proceedings of the National Academy of Sciences*, 118(29). <https://doi.org/10.1073/pnas.2020104118>

Tabery, J., Novak, N. L., and Sarafraz, L. (2023). Victims of eugenic sterilisation in Utah: Cohort demographics and estimate of living survivors. *The Lancet Regional Health — Americas*, 19, 100436. <https://doi.org/10.1016/j.lana.2023.100436>

Terry, M. B., Michels, K. B., and Brody, J. G. (2019). Environmental exposures during windows of susceptibility for breast cancer: A framework for prevention research. *Breast Cancer Research*, 21(1). <https://doi.org/10.1186/s13058-019-1168-2>

Triantafyllidou, S., and Edwards, M. (2011). Galvanic corrosion after simulated small-scale partial lead service line replacements. *Journal of the American Water Works Association*, 103(9), 85–99. <https://doi.org/10.1002/j.1551-8833.2011.tb11535.x>

Trueman, B. F., Camara, E., and Gagnon, G. A. (2016). Evaluating the effects of full and partial lead service line replacement on lead levels in drinking water. *Environmental Science and Technology*, 50(14), 7389–7396. <https://doi.org/10.1021/acs.est.6b01912>

Van Steenbergen, J., Wing, P., and D'hulster, K. (2016). The Mamlukization of the Mamluk Sultanate? State formation and the history of fifteenth century Egypt and Syria: Part I — Old problems and new trends. *History Compass*, 14(11), 549–559. <https://doi.org/10.1111/hic3.12357>

Vester, A., Xu, Y., and Newman, N. (2025). Cumulative childhood lead exposure estimation and school-age IQ in a prospective birth cohort. *Environmental Health*, 25(1). <https://doi.org/10.1186/s12940-025-01244-w>

References — Scholarship (6 of 6)

Wall, J. (2010). *Ethics in light of childhood*. Georgetown University Press.

Wiesner-Hanks, M. E. (2008). Do women need the Renaissance? *Gender and History*, 20(3), 539–557. <https://doi.org/10.1111/j.1468-0424.2008.00536.x>

Winter, S., and Wilkinson, M. (2024). Evaluating paternalism in redress programs. *Politics and Policy*, 52(6), 1399–1416. <https://doi.org/10.1111/polp.12635>

Winter, S. (2020). Tools for tragedy: Procedures for assessing historic redress claims. *Politics and Policy*, 49(1), 162–185. <https://doi.org/10.1111/polp.12385>

Wray-Lake, L., Rottenberg, J., and Kennedy, H. (2025). Anti-youth ageism: What it is and why it matters. *Child Development Perspectives*, 19(3), 172–178. <https://doi.org/10.1111/cdep.12540>

Young-Bruehl, E. (2012). *Childism: Confronting prejudice against children*. Yale University Press. end{list}

Cases

A.M. v. Omegle.com LLC, 614 F. Supp. 3d 814 (D. Or. 2022).

Angelilli v. Activision Blizzard, Inc., 781 F. Supp. 3d 691 (N.D. Ill. 2025).

Calise v. Meta Platforms, Inc., 103 F.4th 732 (9th Cir. 2024).

Connecticut Fair Housing Center v. CoreLogic Rental Property Solutions, LLC, 369 F. Supp. 3d 362 (D. Conn. 2019).

Courtright v. Epic Games, Inc., 795 F. Supp. 3d 1156 (W.D. Mo. 2025).

Doe v. Twitter, Inc., 555 F. Supp. 3d 889 (N.D. Cal. 2021).

Erznoznik v. City of Jacksonville, 422 U.S. 205 (1975).

Hammer v. Dagenhart, 247 U.S. 251 (1918).

In re RealPage, Inc., Rental Software Antitrust Litigation (No. II), 709 F. Supp. 3d 469 (M.D. Tenn. 2023).

Louis v. SafeRent Solutions, LLC, 685 F. Supp. 3d 19 (D. Mass. 2023).

M.H. v. Omegle.com LLC, 122 F.4th 1266 (11th Cir. 2024).

Mobley v. Workday, Inc., 740 F. Supp. 3d 796 (N.D. Cal. 2024).

M.P. v. Meta Platforms, Inc., 127 F.4th 516 (4th Cir. 2025).

United States v. Darby, 312 U.S. 100 (1941). end{list}

Statutes and regulations

Asbestos Hazard Emergency Response Act of 1986, 15 U.S.C. §§ 2641–2656.

Clean Air Act 1956, 4 & 5 Eliz. 2 c. 52 (UK).

Communications Decency Act § 230, 47 U.S.C. § 230.

Fair Labor Standards Act of 1938, 29 U.S.C. §§ 201–219.

Indian Act, R.S.C. 1927, c. 98 (Can.), as amended 1920.

Lead and Copper Rule Improvements, 89 Fed. Reg. 86,282 (Oct. 30, 2024).

Radiation Exposure Compensation Act of 1990, 42 U.S.C. § 2210 note. end{list}

Corpus case records (1 of 2)

Real Safety AI Foundation, *Harm Corpus*. Case records cited by identifier:

ANCIENT-106, Mamluk Slave Soldiers.

COLONIAL-118, Canada Residential Schools.

CONTEMPORARY-057, Lead Paint.

CONTEMPORARY-154, Flint Water Crisis.

CONTEMPORARY-186, Newark Lead in Water.

CONTEMPORARY-062, Agent Orange in Vietnam.

CONTEMPORARY-064, Nestlé Infant Formula Marketing.

CONTEMPORARY-184, Washington DC Lead in Water.

CONTEMPORARY-201, Immigration Detention and Family Separation.

CONTEMPORARY-203, Asbestos and Lead in Public Housing.

MEDIEVAL-013, Ottoman Devshirme.

MODERN-139, U.S. Indian Boarding Schools.

MODERN-054, Leaded Gasoline.

MODERN-147, North Carolina Eugenics Board.

MODERN-151, Willowbrook Hepatitis Studies.

MODERN-152, Guatemala Syphilis Experiments.

MODERN-155, Camp Lejeune Contaminated Water.

Corpus case records (2 of 2)

- MODERN-156, Nevada Test Site Downwinders.
- MODERN-160, Hanford Green Run and Fernald Exposure.
- MODERN-165, Fernald and Wrentham Science Club Experiments.
- MODERN-174, Magdalene Laundries in Ireland.
- MODERN-175, Tuam Mother and Baby Home.
- MODERN-176, Stolen Generations in Australia.
- MODERN-188, Great Smog of London.
- MODERN-193, Asbestos in Schools and Public Buildings.
- MODERN-199, Child Labor in U.S. Mills, Mines, and Canneries.
- MODERN-204, Swill Milk in New York.
- MODERN-207, Aberfan Colliery Spoil Tip Collapse.
- TECH-010, Instagram Teen Mental Health.
- TECH-030, Companion Chatbots and Vulnerable User Harm.
- TECH-036, Video Game Addiction Litigation.
- TECH-037, Twitter CSAM Retention.
- TECH-038, Omegle Random Pairing and Child Predation. end{list}