Beyond the TCDD Lens in Paritutu, New Plymouth, New Zealand

Invisible Phenoxy-Herbicide Co-Contaminants,
Visible Developmental Signals, and
Decision-Making under Incomplete Evidence

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1. Why this problem matters

Historical exposure can outlast the records needed to reconstruct it.

A focus on TCDD can leave other components of a mixture unresolved.

Community health concerns require investigation and a response.

The question: what evidence should trigger further inquiry?

2. Theoretical framework

Research disciplines can leave gaps between their separate questions.

Exposure reconstruction and health assessment answer different questions.

Highly exposed families may disappear within wider population averages.

Repeated signals can guide hypotheses even when attribution remains uncertain.

3. Research approach

Reconstruct production, spraying and possible release pathways.

Link official records with maternity, mortality and family histories.

Audit missing records, regrouping and changes to cohort definitions.

Compare contested observations across independent evidence streams.

Examine repeated patterns across species without assuming a common cause.

The historical mixture

Documented measurement

TCDD
Other dioxins and furans
Dioxin-like PCBs in a subset

Questions for reconstruction

Chlorinated phenols
PCDEs and other impurities
Combustion related changes

Measured profiles constrain the inquiry. Unmeasured components still need evidence.

4. Key findings: documented TCDD exposure

52 volunteers

Serum study of former Paritutu residents

High 1965-68 exposure

Highly significant 2004 TCDD elevations primarily among older pre 1969 residents

Fowles et al. (2009) demonstrated historical TCDD exposure.
The study does not establish the cause of every reported health outcome.

Developmental and reproductive signals

Gibbs reports patterns in family, maternity and livestock records.

The inquiry asks whether timing and location coincide with exposure opportunities.

Detailed study must retain highly exposed groups and relevant comparisons.

Reported patterns support hypothesis generation. Causation remains unresolved.

Toxicological comparison

The author’s proposed comparison

TCDD and 2,4,5-T versus 2,4-D and chlorophenol and combustion-derived fractions.

Comparison of reproductive and developmental endpoints.

Differences in test material, dose and timing matter.

Laboratory patterns can guide inquiry into field observations.

Evidence and remaining uncertainty

Evidence stream	What it supports	What remains unresolved
Serum and soil study	Historical TCDD exposure	Complete mixture and health attribution
Family and livestock reports	Questions about recurring patterns	Denominators, selection and confounding
Documentary reconstruction	Assessment of research coverage	Missing records and historical doses

Decision-making under incomplete evidence

Health support should be based on recommended research, instead of replacing it

Evidence audits need provenance and a visible correction history.

Independent review can address possible conflicts of interest.

Anonymised data can enable scrutiny with appropriate privacy protection.

Wider environmental research implications

Differing linear regression findings should be reported and not merged and obscured

The related dolphin studies illustrate gaps between exposure and population inference.

Cross-species observations can guide research without establishing a shared cause.

Historical chemical legacies require transparent comparison of competing explanations.

5. Key takeaways

Historical TCDD exposure provides an established starting point.

Mixture reconstruction should test what earlier measurements leave unresolved.

Recurring observations need transparent, targeted investigation.

Community support should use rather than replace recommended focused investigations

Selected references

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Thank you for your attention

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Discussion: how should research respond when contaminant mixtures remain unresolved?

Extended bibliography

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