

Ecological Trend Analysis

Ecological trend analysis is a type of **descriptive epidemiological study** that examines changes in disease rates, exposures, or health outcomes over time using **population-level (grouped) data**, rather than individual-level information.

Key Features

- **Unit of analysis:** groups or populations (e.g., countries, regions, age cohorts), not individuals.
- **Objective:** to assess **temporal patterns** and **trends** in disease burden, risk factor exposure, or health outcomes.
- **Data sources:** often derived from national registries, surveys, census data, international databases (e.g., WHO, GBD).
- **Commonly used in:**
 - Global burden of disease studies
 - Environmental health (e.g., air pollution, climate)
 - Socioeconomic or policy impact assessments
- **Methods:**
 - Time series analysis
 - Regression models (e.g., Joinpoint, Poisson, or age-period-cohort models)
 - Age-standardized rate comparisons across time

Strengths

- Useful for generating hypotheses
- Enables cross-national or global comparisons
- Can identify public health priorities and monitor progress over time

Limitations

- Subject to **ecological fallacy** — associations at the group level may not hold at the individual level.
- May be affected by confounding variables that vary between groups or over time.

Related Terms

- [Ecological study](#)
- [Time trend analysis](#)
- [Global burden of disease \(GBD\)](#)

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