
The epidemiology of artificial intelligence

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Supplementary Information

Table S1: AI compared with the established determinants of health. Biological, environmental, social, behavioural, and digital determinants are rated against the dimensions that distinguish AI as an exposure. AI is set apart by the conjunction of these properties, not by any single one. The feedback-loop property is where the environmental analogy breaks down most directly, since a pollutant does not adapt to the person it exposes whereas an AI system does, reshaping its outputs in response to the user's behaviour through mechanisms such as reinforcement learning from human feedback.

Determinant	Content generation	Real-time adaptation	Feedback loops	Cross-category operation	Stationarity
Biological (e.g., genetics)	No	No	No	Primarily biological	Stable
Environmental (e.g., air pollution)	No	No	Minimal	Primarily environmental	Relatively stable
Social (e.g., income, support)	No	No	Limited	Primarily social	Slow-changing
Behavioural (e.g., smoking)	No	No	Some (addiction cycles)	Primarily behavioural	Relatively stable
Digital (e.g., social media)	Partial (user + curated)	Partial (algorithmic feeds)	Yes (engagement optimisation)	Information + social	Moderate change
AI (e.g., chatbots, clinical algorithms)	Yes (novel content)	Yes (personalised)	Yes (endogenous; RLHF-driven)	Information + behavioural + clinical + social	Rapid, non-transparent updates