Prognosis and Prediction:

Uncertainty Management in Oncology and Meteorology

a philosophy talk by **Brandon Boesch** (Morningside University)

Friday, March 15th · 3:30pm · Close-Hipp 364 · reception to follow

The task of offering an accurate prognosis (survival time and disease progression) after a cancer diagnosis is uncertain; at best–tumors are heterogeneous, there is variability in treatment, many cancers suffer from insufficient data, and doctors are subject to the impact of many cognitive biases when they do attempt to offer a prognosis. In order to shed light on means of dealing with uncertainty in cancer prognosis, I will turn to examine some lessons from meteorology. Meteorological predictions are famously subject to an ineliminable uncertainty. Weather prediction agencies have developed several methods to ensure that uncertain forecasts can still allow for meaningful improvement of positive impacts—saving lives and protecting property. Some of these can inform cancer prognosis: the use of ensemble models, the importance of expertise, a concern to maintain credibility through a "Crying Wolf Principle," a focus on impacts rather than precision, and a shift from forecasting to "now-casting" at a certain point. Boesch explains the importance of each of these in cancer prognosis and identifies some initial steps taken in these directions by oncologists. While uncertainty in cancer prognosis will likely never be completely eliminated, there are meaningful methods which health professionals can use to manage and communicate that uncertainty.

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