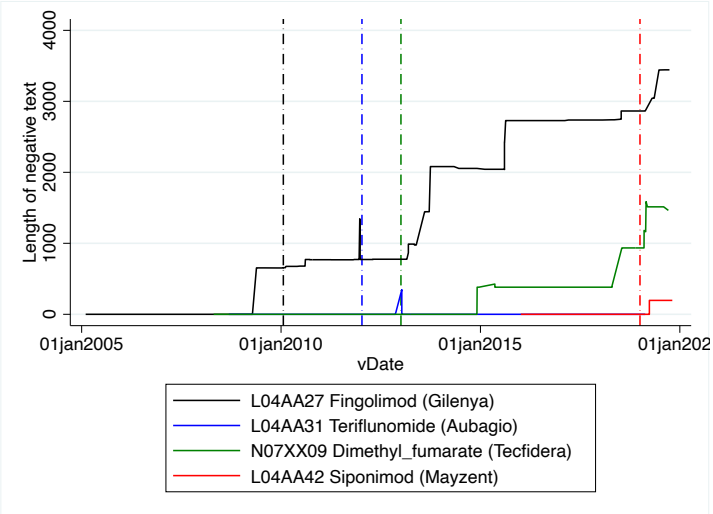
Strategic Information Disclosure: Evidence from Wikipedia Drug Pages
Small Grant Proposal for NBER PIE Program

We propose a study of how online platforms affect the dissemination of information. Specifically, we will look for evidence that drug companies and their surrogates strategically reveal negative information about rival products and conceal negative information about their own, building on the stylized fact that the amount of negative information listed about a drug increases as competition intensifies.

Using variation in the timing of drug launches, patent expirations, and adverse events, we will measure the extent of this behavior based on edits to the adverse events sections of Wikipedia pages for the drug classes that include the 100 top-selling drugs. Under the hypothesis that a drug company will act to portray itself more favorably in the face of greater competition, we will investigate whether the relative amount of negative information listed on Wikipedia, the most-used platform for information on drugs by doctors (Tucker, 2014, Medscape Medical News), increases following the entry of a generic drug or the launch of a different molecule in the same therapeutic class.

As a demonstration of our approach, consider the four prominent drugs used to treat multiple sclerosis (MS). The length of the negative text on the Wikipedia page for each MS drug is shown in the figure below, with dashed lines indicating FDA approvals and solid lines indicating negative information. We see longer negative text in Wikipedia at the time of a launch for a competing product. For example, a few days after the FDA approval of siponimod (brand name Mayzent), the negative information for competitor dimethyl fumarate (brand name Tecfidera) increases.



We will extend this approach to other leading drugs, as shown in Table 1 below.

Table 1: The impact of own or competitor entry on negative information on Wikipedia. Outcome variable: Relative length of negative text on Wikipedia. Entry **timing** measured by **FDA approval**.

	Clustering on molecule			Clustering on drug group		
	(1)	(2)	(3)	(4)	(5)	(6)
Own entry this period	-0.019**	-0.014**	-0.018**	-0.019	-0.014	-0.018
	(0.008)	(0.007)	(0.007)	(0.011)	(0.010)	(0.011)
Own entry next period	-0.020***	-0.016**	-0.020***	-0.020*	-0.016*	-0.020*
	(0.007)	(0.007)	(0.007)	(0.010)	(0.009)	(0.010)
Own entry last period	-0.022***	-0.017**	-0.020***	-0.022*	-0.017*	-0.020*
	(0.008)	(0.007)	(0.007)	(0.010)	(0.009)	(0.010)
Competitor entry this period	0.007**	0.007**	0.002	0.007***	0.007***	0.002
	(0.003)	(0.003)	(0.004)	(0.002)	(0.002)	(0.003)
Competitor entry next period	0.006**	0.006**	0.003	0.006***	0.006***	0.003
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)
Competitor entry last period	0.006*	0.006*	0.002	0.006**	0.006**	0.002
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)
Months since entry	No	Yes	Yes	No	Yes	Yes
Time period FE	No	No	Yes	No	No	Yes
Molecules	100	100	100	100	100	100
Clusters	100	100	100	15	15	15
Observations	14927	14927	14927	14927	14927	14927

Notes: Observation is a month-molecule pair. Each column reports estimates from a separate panel data fixed effects regressions where the dependent variable is the relative length of negative text on Wikipedia. Each regression includes molecule fixed effects. Standard errors are clustered either on molecule (columns 1-3) or drug group (columns 4-6).

From the regression, it is clear that (i) the relative amount of negative information listed on a drug's Wikipedia page decreases immediately around its own launch and (ii) the amount of negative information increases around competitors' launches.

Over the coming months, we plan to enrich this analysis in several ways. First, we will tie this behavior to market outcomes using data on prescriptions. Second, we will link the edits to corporate headquarters using the IP addresses of Wikipedia editors. Third, we will merge in data on the adverse events for drugs, the ground truth for negative information.

With an NBER grant, we will acquire (either through direct purchase or from the work of a research assistant) the data to supplement and complete this analysis. Specifically, this project will require data on drug prescriptions and Wikipedia pages over time.

The research team includes three economists. Marit Hinnosaar is an expert on digital economics who has conducted seminal field experiments using Wikipedia. Ryan McDevitt is an expert on causal identification of strategic business behavior in the health sector. David Ridley is an expert on pharmaceutical economics.