

## A Crisis in the Making: Wikipedia Documents the Opioid Epidemic (2001-2023)

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### Abstract

Wikipedia plays a key role in public dissemination of scientific and medical knowledge, affecting societal and health-related perspectives and decisions. This study delves into Wikipedia's portrayal of the opioid crisis, a major public health challenge. Analyzing over 200 articles related to opioids, we examined the evolution of public health discourse, attributions of blame, and discussions on treatments within the context of the opioid epidemic. Our findings suggest that Wikipedia's coverage of the opioid crisis was belated, with crucial articles appearing long after the epidemic's public acknowledgment. Initially, narratives blamed pharmaceutical practices and over prescription but later shifted towards patient responsibility, mirroring wider media trends that stigmatize addiction. Treatment discussions primarily highlighted drug-based approaches, which often obscure the inherently addictive nature of opioids. Moreover, though well sourced, the articles failed to adequately address opioid-induced hyperalgesia, a lesser-known yet severe consequence of opioid use that exacerbates addiction and patient suffering. These oversights represent knowledge gaps on Wikipedia that are reflective of a misinformed public discourse and poor medical and governmental responses to the crisis. Our research underscores the need to enhance the accuracy and comprehensiveness of Wikipedia's content and more effectively contribute to public understanding to mitigate the ongoing opioid crisis.

**Keywords:** Opioid crisis, English Wikipedia, public health, opioid-induced hyperalgesia, contemporary history

### Introduction

Wikipedia's articles top search engine results, making it a key node in the transference of knowledge to the public. Wikipedia is also subject to sociological and historical studies (Ford, 2022) and specifically history of science (Benjakob et al., 2023; Benjakob & Aviram, 2018).

Bibliometric analyses show scientific topics generally accurately reflect the state of research in their field and tend to cite relevant, high-quality scientific literature; for example, during the COVID-19 pandemic (Arroyo-Machado et al., 2020; Benjakob et al., 2022; Colavizza, 2020). Importantly, medical professionals are active consumers and editors of Wikipedia making its medical content “a key tool for global public health promotion” (Heilman et al., 2011). Understanding which knowledge is reaching the public, its framing and supporting sources, has real-world effects and can help promote not just public medical literacy on issues with potentially lethal ramifications, but also help mitigate them.

The “opioid crisis” relates to the widespread opioid use, addiction and overdose deaths, primarily occurring in the U.S. Its roots can be traced back to the 1990s, fueled by the over prescription of opioid painkillers throughout 2011 when the U.S. administration declared an “epidemic”, (Fig1A). Further escalation continued along the 2010's as opioid analogues became major drivers of overdose deaths. Currently, misuse, addiction, and deaths continue to climb, resulting in a devastating public health emergency. In recent years, the crisis has been topping headlines in academic and public media, and rank among the top concerns of medical, public health and policy communities.

We propose Wikipedia is uniquely poised to track the trajectory of the epidemic, its public perception and even potential mitigation policies. Here, we hence utilize the encyclopedia's archives to find lacunas or so-called knowledge circulation gaps, which may address underlying issues exacerbating the public health crisis at the core of the opioid epidemic.

### Methods

Our research combines approaches from traditional history of science and computational digital humanities, addressed in full in a methodological paper (Benjakob et al., 2023). Here, we first identified relevant Wikipedia articles using a specially built “corpus builder” which yielded 241 articles relating to “opioids”. Computational tools we developed scraped articles' metadata, such as edits, contributors and bibliometrics to better understand their growth over time. Next, we focused on a number of “anchor articles”: Opiate, Opioid, Opioid epidemic, Opioid epidemic in the U.S., and Opioid Induced Hyperalgesia (OIH), which represented the core terms related to the drug, the crisis, the science behind

them and the epidemic's ramifications. Qualitatively, we analyzed their content - their current text, but also their past versions, examining thousands of their edits spanning over 20 years, to construct a timeline of the representation of the opioid field on Wikipedia from 2001 until 2023.

## Results

Though Wikipedia long had articles dedicated to multiple opioids, and even “Addiction”, we found that articles dealing explicitly with the epidemic were created rather late: “Opioid epidemic” and the “Opioid epidemic in the US” were created only in 2019 and 2017, respectively. The term opioid “crisis”/“epidemic” first appeared in the “Opioid” article in 2014, although it opened in 2004. “Opiate”, from 2001, and “OIH”, from 2006, do not refer to the crisis to this very day. This offset and lacuna is indicative of a wider issue regarding the way the terms crisis/epidemic appeared on Wikipedia: Of our entire opioid-articles corpus, the majority do not mention the term at all, including those for methadone and buprenorphine, long lasting opioids that are prescribed as alternatives to short acting opioids as part of attempts to address addiction, or even the article for “opioid withdrawal” (Fig 1B). These are all terms linked to the very crisis their articles fail to mention and include information underlying its spread. Articles that did mention it did so much later, years after the crisis became an accepted fact. Issues of blame for widespread addiction, we found, were heavily debated on Wikipedia, with attribution of accountability shifting between drug producers, pharmaceutical marketeers, doctors, policy makers and finally patients. For example, earlier versions of the American epidemic article began by forward placing accountability on dangerous marketing strategies, over prescription by negligent doctors, future edits began to shift the blame towards patients, with issues being cast as a result of disobeying doctor's orders. This was reflective of a wider trend documented in public media (Webster et al., 2020). Our analyses further revealed that though the main articles did showcase different treatments, these heavily relied on drug-based solutions, including opiate substitution therapies, such that could lead to further addiction or even exacerbate addictions' dangerous symptoms. Moreover, throughout the edit history we observed a transition from using more explicit terms like methadone maintenance treatment or buprenorphine maintenance therapy, to more vague terms like medication-assisted treatment (MAT). These alternatives are in essence the same approach: replacing one drug with another. Indeed, the use of longer acting opioids might allow for longer intervals in which the patient is maintained and might function normally, however the addict remains addicted all the same. While MAT is commonly used in modern day discussions, it in fact conceals the actual continued use of opioids, cementing them as “medications” instead. Last, we found long term medical issues arising from opioid addiction were underplayed or even siloed off in medical

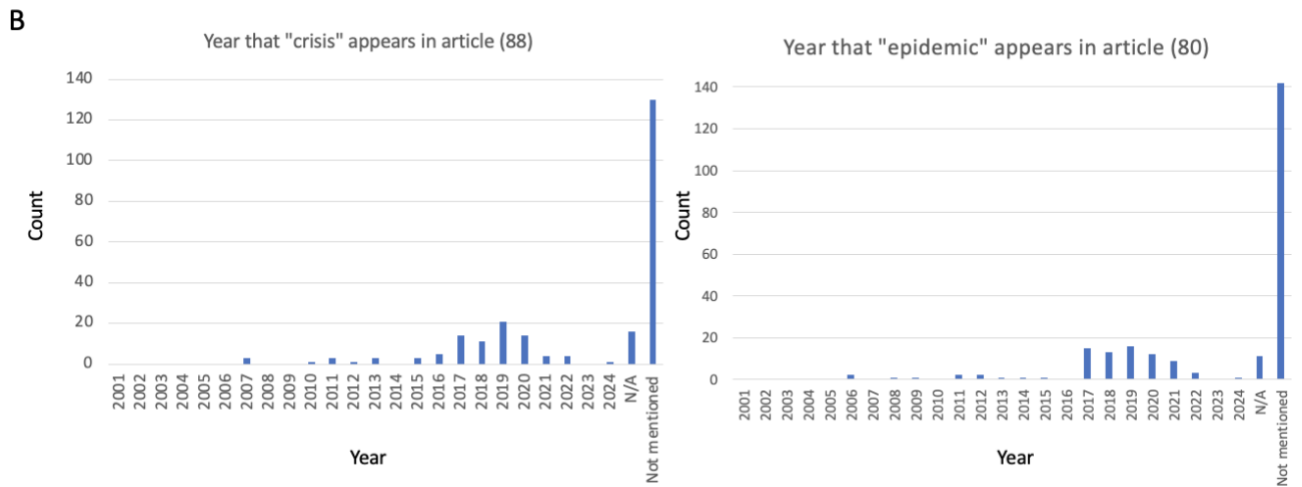
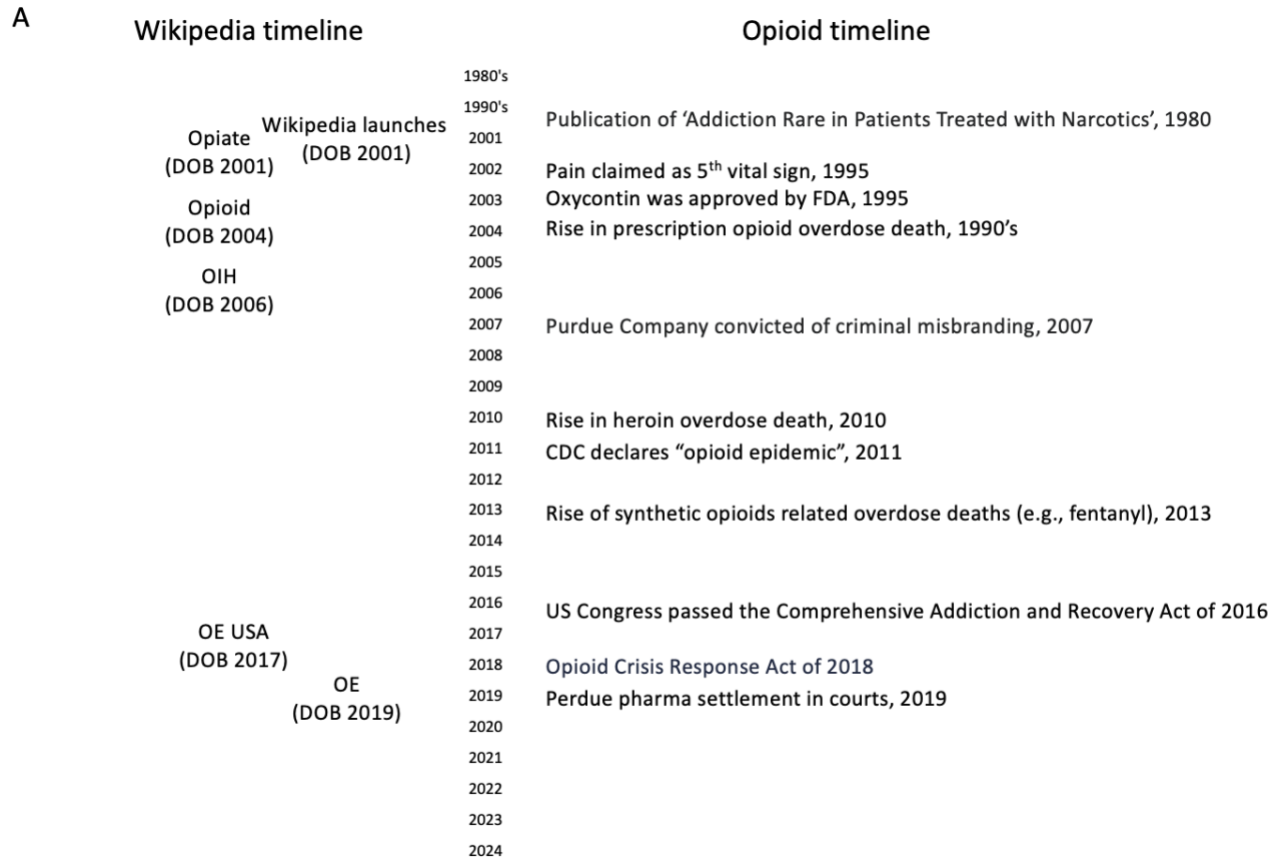
articles that do not seem public facing. One such effect is OIH - the deterioration in pain experienced by patients undergoing opioid treatment. The result is both addictive and dangerous: doctors and patients, unfamiliar with OIH, might dismiss suffering patients suffering as drug seeking behavior. While the OIH article existed since 2006, with solid sources and comprehensive coverage, our work shows that the other opioid-related articles neither covered the topic thoroughly nor in many cases link to the OIH article. Thus, an issue with potentially massive health implications was cloistered in its own article seemingly unrelated to the epidemic, a prime example of a knowledge circulation gap between the public and the medical community.

## Discussion/Conclusions

Our findings show that Wikipedia reflected many of the issues that have served as the backdrop for the opioid crisis. This ongoing study may eventually help elucidate the underlying lacunas in public communication of the phenomena of addiction and the science behind it. The knowledge gaps we identified underscore the need for more comprehensive coverage, essential for an informed public and for aiding and not hindering responses to the crisis.

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**Figure 1: Wikipedia's coverage of the opioid crisis was belated.** A) Timeline of selected key events in the opioid crisis (Right) compared with Wikipedia's coverage (Left), focused on the timeframe since Wikipedia's launch in 2001. B) The appearance, or lack thereof, of the terms "crisis" and "epidemic" in the corpus articles grouped by year. The term "crisis" appeared in 88 articles, and "epidemic" in 80.