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ORIGINAL RESEARCH

First Do No Harm (online): When Healthcare Practitioners Become Agents of Information Pollution

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Abstract
Over the last decade, the creation and dissemination of health-related information pollution has been investigated as a topic of criminological concern, especially in its manifestation as a distinguishing criminogenic and harming feature of life in cyberspace. This contribution furthers this line of inquiry by focusing on health-related information pollution disseminated online by healthcare practitioners. This phenomenon has severe implications in terms of healthcare practitioners' ethical and professional responsibility, and public trust. By examining how current regulatory practices in both Italy and the UK are only recently starting to acknowledge the issue of healthcare practitioners involved in the creation and propagation of health-related information pollution, and are still doing so in a partial and ineffective way, this article discusses how, in the social media platforms facilitating the spreading of health-related information pollution, the boundaries between personal and professional use are blurred, yet they both shape public identities; this entails specific challenges when it comes to possible management or mitigation strategies.

Keywords Information pollution · COVID-19 · Disinformation · Misinformation · Health · Self-regulation

Introduction

The proliferation of misinformation and disinformation has emerged as a pressing concern, including in relation to healthcare. Within the broader umbrella term of 'information pollution' (Wardle & Derakhshan, 2017), misinformation can be defined as information

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that contradicts the medical scientific consensus that is shared without meaning any harm, whereas disinformation is defined as a coordinated or deliberate effort to spread misinformation for gain. Distinguishing between misinformation and disinformation can be challenging because the intent behind a message isn't always clear, but both can pose significant challenges to public health (Swire-Thompson & Lazer, 2020).

The evolution of the web 2.0 technologies has profoundly transformed health communication, creating new avenues for the dissemination of misleading and potentially harmful information. On the one hand, doctored websites, deep fakes, and leaked or altered information after a cyber security breach are identified as major potential disinformation threats (Neylan et al., 2021); on the other hand, new opportunities for two-way communication and socialisation online allow new venues, modalities and social incentives for promoting fringe information (Lavorgna, 2021a; Melchior & Oliveira, 2022). With technological developments, healthcare has also been reconfigured in meaningful ways, with digital health (i.e., 'the cultural transformation of how disruptive technologies that provide digital and objective data accessible to both caregivers and patients […] leads to an equal level doctor-patient relationship with shared decision-making and the democratisation of care' – see Meskó et al., 2017) increasingly impactful in providing care and practicing medicine.

While members of the healthcare community have been encouraged to establish an online presence as a proactive way to counter mis- and dis-information, such as getting involved in digital health literacy programs (Rubin, 2019), some healthcare practitioners are involved in the creation and propagation of health-related information pollution (see for instance Lavorgna & Horsburgh, 2019; Saver, 2023; Grimes & Greenhalgh, 2024) – a phenomenon that has severe implications in terms of healthcare practitioners' ethical and professional responsibility, and public trust. Whilst there are guidelines in place to prevent healthcare practitioners from creating and sharing medical mis- and dis-information, the issue remains.

This contribution furthers this path of inquiry from a socio-legal perspective: after presenting the criminological relevance of the problem, and how it intermingles with how online identities are developed and curated online, it relies on framing analysis to evidence how current regulatory practices in both Italy and the UK are starting only recently to acknowledge the issue of healthcare practitioners involved in the creation and propagation of health-related information pollution, and are still doing so in a partial and ineffective way. Finally, possible management and mitigation strategies are discussed.

Health-related Information Pollution and its Digitalisation

While the creation and dissemination of health-related information pollution is nothing new (Lerner, 1984; Jin et al., 2024), it certainly received a boost with the digitalisation of information, and the web 2.0. On the one hand, the proliferation of digital platforms has democratised access to information, including health-related information. On the other hand, whilst this can be beneficial, such increased accessibility has also been accompanied by a surge in health-related information pollution, encompassing misinformation, disinformation, and misleading or inaccurate content, posing a significant threat to public health. While the issue of mis- and dis-information has received cross-disciplinary attention over the years (consider, among the many contributions, Alghamdi et al., 2024; Broda & Strömbäck, 2024; Melchior & Oliveira, 2024) with a few studies focusing specifically on health

(e.g., Kbaier et al., 2024; Rodrigues et al., 2024), only over the last decade has this issue started to receive criminological attention (for instance, Lavorgna & Di Ronco, 2017, 2018; Lavorgna & Horsburgh, 2019; Massa, 2019; Markovska et al., 2019). Overall, there has been an unequivocal surge in attention from the discipline and, more broadly, by socio-legal researchers during the COVID-19 pandemic (such as Kennedy et al., 2021; Lavorgna, 2021a; Lavorgna et al., 2021; Lavorgna & Myles, 2022; Laskai & Nagy, 2023; Miró-Llinares & Aguerri, 2023). After all, as a 'total social fact' (Mauss, 1923) impacting all aspects of the life of individuals in our society, the pandemic for months influenced our practices, institutions and symbols alike, and as such affected how we think and act. In this scenario, it brought some individuals closer to digital sources of health-related information pollution at a scale that was difficult to ignore (Balakrishnan et al., 2022); at the same time, social changes during the pandemic hastened the digitisation of healthcare in several countries (Golinelli et al., 2020; Marx & Padmanabhan, 2020), impacting doctor-patient relationship as digitally mediated.

This issue matters from a criminological perspective not only because, in some extreme cases, health-related information pollution is criminalized (consider, for instance, the 1939 Cancer Act in the UK which, among other things, prohibits certain advertisements relating to cancer, but that was obviously drafted before the digital age, and predated the NHS - see The Lancet Oncology, 2020; Lavorgna & Carr, 2021), but – more broadly – because it produces a wide array of social harms, ranging from financial, physical, and psychological/emotional harms to the primary victims, as well as public health problems, and loss of confidence in the professional scientific and medical norms (Lavorgna, 2021a). More specifically, health-related information pollution can interfere with healthcare workers' ability to carry out effective health communication, shaking the confidence of the public in the healthcare systems (Neylan et al., 2021). It must be noted, however, that the impact of this misleading and potentially harmful information is not uniform; it varies across different segments of the population due to disparities in social, cultural, and digital capital (Jackson & Baur, 2021; Nan et al., 2022).

Providing an in-depth analysis of the relevance of criminological contributions focusing on social harms and the critical approaches underpinning them (from the works of Hillyard et al., 2004, Hillyard & Tombs, 2007 and Pemberton, 2007 to the more recent volumes by Caning & Tombs, 2021 and Davies et al., 2021) is beyond the scope of this contribution (see Lavorgna, 2021a, 2021b for a detailed discussion of this issue). Nonetheless, it is worth at least noting that, while recent literature framing information pollution as social harm has advanced the literature on social harms by stressing how, through digital affordances, less powerful groups who feel victimised can also create harms (for instance by propagating misinformation in the process of digitally 'resisting' public health policies; see Lavorgna et al., 2022; on the technology-harm nexus see also Wood, 2022), this contribution – in line with mainstream social harm literature – emphasises the role of socially empowered actors in propagating the same types of harms. In either case, non-criminalised, technology-enabled harmful social practices that are typically minimised and deemed outside the purview of criminal justice intervention end up victimising the less powerful in society (in the context of health-related matters, those with health problems and/or those with more limited knowledge capital).

Ideally, those providing or promoting health-related information online should be well-prepared, competent members of the medical community who are able to improve public

health communication with their follower base (MacDonald & Brianna, 2023; Grilli, 2024) – regardless of whether they do it occasionally, or as 'health influencers' (that is, social media influencers spreading health and wellness information and affecting health behaviour). In practice, however, those providing or promoting health-related information online are often associated with the creation and propagation of potentially dangerous mis- or disinformation (Lavorgna & Sugiura, 2019; Topham & Smith, 2023; Moran et al., 2024), and, because of the participatory affordances of social media, with the spread of conspiratorial thinking and even far-right extremism (Baker, 2022; Zimdars, 2024). Health influencers in particular, because of social media dynamics (see Swire-Thompson and Lazer (2020) are considered key actors in carrying out harmful mis- or dis- information campaigns (Engel et al., 2024; Kaňková et al., 2024; Denniss & Lindberg, 2025) for personal gain (consider, for examples, the cases described in Lavorgna & Horsburgh, 2019; Lavorgna & Myles, 2022; Ng et al., 2024).

However, there are a variety of sources of health-related information pollution, including state, civil groups, health-care professionals and individuals (see for instance Marwick & Lewis, 2017; Neylan et al., 2021; Walsh et al., 2023). Also, motivations can be varied and may include profit, ideological or even political motives. For example, companies, governments or individuals may disseminate misleading health information to market products or services, capitalising on public anxieties and vulnerabilities. Neylan and colleagues (2021) give the example of the Kremlin-backed influence campaign against the COVID-19 Pfizer vaccine, as an example of a state actor running a disinformation campaign on health matters.

Individuals, whether intentionally or unintentionally, also contribute to the spread of inaccurate health information through social media posts, online forums, and other digital platforms, often sharing personal anecdotes as medical advice or promoting unverified claims. Lavorgna and Horsburgh (2019) provided a multi-dimensional typology of individual providers of health-related disinformation, recognising that they should not be considered as part of a homogeneous group. They distinguished among (1) utilitarian providers (moved mainly by the desire to obtain financial profit); (2) custodial providers (with the subtypes 'good-faith' providers, who genuinely think they are helping the victim, and 'the egotistical fake' providers, stiving to receive credit, social validation, and legitimation); (3) sexual abusers, acting as providers to have access to vulnerable victims; and (4) delusional providers, who believe themselves to be on a mission to heal or to rid the world/their social circles of westernised, science-based medicine, and/ or 'big-pharma' influences.

Whilst health-related information pollution was traditionally promoted and spread by word of mouth, pamphlets and social circles (Jin et al., 2024), the digital arena – as noted above – gave promoters, supporters and receivers of such information pollution (to follow the distinction of the individual actors behind medical information pollution as discussed in Lavorgna (2021a) new tools and *modi operandi* to build networks, facilitating socialisation with what are perceived as like-minded people by structuring intra-group attitudes and beliefs, but also facilitating their engagement with a larger audience (for an in-depth discussion on this aspect, see Lavorgna, 2021a). Additionally, besides the new social opportunities offered by social media, it is worth stressing that the architecture of digital media (Frischlich & Humprecht, 2021) and online disinformation campaigns can also utilize automated tools such as bots and fake accounts to drown out health policy content they disagree with (Neylan et al., 2021), targeting potential victims in more efficient and effective ways (Broniatowski et al., 2018).

While most health-related information pollution does *not* involve members of the healthcare community, healthcare providers could unwillingly be involved in disinformation campaigns, or in some cases they might actively act as promoters of information pollution (consider the examples provided in D'Amato, 2019; Lavorgna & Horsburgh, 2019; Markovska et al., 2019; Neylan et al., 2021; Foong-Reichert et al., 2022; Grimes & Greenhalgh, 2024; Morsello et al., 2024). As exemplified by Neylan and colleagues (2021), consider for instance: videos or images of healthcare practitioners which might be taken out of context, or labelled incorrectly, to promote false narratives in disinformation efforts; controversial findings can be misinterpreted to generate fear; and information posted by members of the healthcare community can be altered or miscommunicated. Additionally, some healthcare professionals can choose to misuse their titles to lend credibility to unscientific or outright false claims (Farnan et al., 2013; Neylan et al., 2021). Unfortunately, as healthcare professionals are viewed as credible sources, their claims garner more attention and 'weight' than those of other individuals, especially when these practitioners gain 'influencer' status, which can make them visible to thousands online, and allow them to find an easier way to promote their views via conventional media outlets, marketable in-person events and lecture tours, and even parliamentary debates (as recently discussed in Grimes & Greenhalgh, 2024).

Both Italy and the UK – the two countries considered in this study – have witnessed prominent cases of members of the healthcare community being formally recognised as promoters of dangerous health-related information-pollution. Among the many examples, quite notorious is the Italian case of the late Tullio Simoncini, a doctor mostly known in the alternative medicine arenas for his claim that cancer is a form of candida overgrowth that can be cured with intravenous sodium bicarbonate. He was expelled from the Italian Order of Doctors (FNOMCeO) in 2003, found guilty of fraud and manslaughter in 2006 after a patient died after receiving his treatment and in 2018, Simoncini received a 5-year jail sentence for culpable manslaughter of a cancer patient in 2011. Simoncini died in 2024, but his ideas are still promoted by his followers first and foremost through several online communities (Lavorgna & Di Ronco, 2018; MedBunker, 2024).

In the UK, an infamous example is that of nurse Kate Shemirani, who during the pandemic communicated health-related information pollution online to thousands of followers and has appeared on national TV and radio channels to discuss how COVID-19 vaccines are dangerous (even suggesting that ingesting disinfectant would be less harmful than the ingredients of vaccines), how COVID-19 is a scam, and that the British National Health Service (NHS), the General Medical Council (GMC), and the Nursing and Midwifery Council (NMC) should not be trusted (NMC, 2021). She also encouraged people to cough on each other and to 'get hugging'. In addition to dangerous information about COVID-19 and vaccines, Shemirani made public disparaging remarks about the NHS and healthcare practitioners that can cause the public to lose trust in them. For example, she wrote on social media that 'The NHS is the new Auschwitz. 4th generation warfare. Silent weapons for quiet wars. You are the target' (Hancock, 2021), and that nurses and other healthcare professionals were murdering patients (NMC, 2021). Following complaints about Shemirani, she has now been permanently removed from the NMC register. Despite this, Shemirani continues to share medical information online and calls herself a 'natural nurse', or 'nurse'.

Overall, as highlighted by Neylan and colleagues (2021), the healthcare community needs to be better prepared for the challenges posed by health-related information pollu-

tion, as healthcare practitioners themselves can be co-opted by disinformation campaigns or otherwise can cause social harms because of recklessness or poor judgment.

Identity Negotiation and Self-regulation

Depending on the contextual space in which they operate, individuals tend to have multiple, dynamic and fluid selves (Goffman, 1959). With the advent of digital media, this aspect became even more evident because the performative dimension of self-expression and self-promotion is at the core of online identities, especially in the social media space (Van House, 2009; Van Dijck, 2013; Mellado & Hermida, 2022). The role of social media in identity formation has been long discussed in the literature, both as regards its dynamic, self-reflective, and performative aspects (e.g., Greenhow & Robelia, 2009) and some of its intrinsic limitations (e.g., Bhandari & Bimo, 2022). In the specific case of the propagation of health-related information pollution, creating and spreading such information is a core feature of both individual and group online identity formation. Specifically, as discussed in detail in (Lavorgna, 2021a), identity construction and the search for recognition within a certain digital community are often key motivators for taking part in online discussions; promoters actively contribute to build and strengthen a sense of group identity, for instance fostering a strong oppositional narrative towards public health policies or scientific consensus, and making a (potentially) stigmatized identity a matter of pride. Members of the community can react in a defensive manner when the perspective of outsiders is reported, as a way to protect the ingroup worldview; when encountering health information and communication that depicts them negatively, threatening their self-image and perceive worth, they react by lowering their perceptions of risk as a mechanism for self-affirmation (*ibidem*).

Online, there can be at times a clash in how we wish to represent our personal and professional identities, in a context where personal and professional lives can become increasingly blurred (Mellado & Hermida, 2022; Rothbard et al., 2022). As such, in social media practices there is often a continuous negotiation between personal and professional use of social media (a tension that has been studied, for instance, in journalistic practice – see Bossio & Holton, 2021; Bossio, 2023). In the case of healthcare practitioners, the situation is further complicated by the fact that the healthcare profession can benefit from an online presence (consider the benefits of professional networking and collaboration, education and training, and patient education and health promotion); but when the negotiation is problematic, there can be dire consequences ranging from loosening accountability and compromising confidentiality, to the depiction of unprofessional behaviour and even legal issues and disciplinary consequences (Vukušić Rukavina et al., 2021).

Researchers have already stressed that guidance should be given to healthcare practitioners on how to establish reasonable boundaries between their personal and professional presence online, acknowledging that poorly judged use of social media can negatively affect both career prospects and professional efficacy (Marshal et al., 2021). More than a decade ago, in a position paper from the American College of Physicians and the Federation of State Medical Boards, Farnan and colleagues (2013) advised that healthcare practitioners maintain separate personal and professional identities online, so as to avoid blurring boundaries in their interactions with patients and colleagues. They assessed the influence of social media on the patient–doctor relationship and their role in public perception of doc-

tors' behaviours, remarking how social media present both opportunities and challenges to professionalism: on the one hand, they offer innovative ways for patient–doctor communication, and can positively affect the health of communities. On the other hand, as patients continue to turn online for healthcare advice, there are risks linked to information pollution and lack of confidentiality; as such, it is advised that institutions have policies in place on the uses of social media. For instance, when a healthcare professional posts questionable content in their personal use of social media, this fact can still affect societal perceptions of the profession (Jeanne at al., 2013). While recognising that both available technology and best practices evolve over time, the position paper encourages healthcare professionals (in this case, specifically doctors) to take a proactive approach to manage their online identities: for instance, they should routinely check what is publicly available, maintain strict privacy settings about their information, and more generally familiarise themselves with the digital space, in order to be able to navigate it safely, and to guide their patients.

A core question to ask is whether and to what extent the online participation of healthcare professionals in the digital arena is currently regulated. As anticipated before, national regulation on the matter is very rare, and international standards non-existent at the moment. This is not surprising, as obviously any legislative attempt would interfere with fundamental rights such as freedom of speech and expression (even if the creation and implementation of concrete legislation is at times advocated, see for instance The Lancet Oncology, 2020). As such, self-regulatory mechanisms play a key role in the matter.

On the one hand, self-regulatory initiatives (and especially corporate documents and forms of self-organisation, consider for instance the terms of service or content policies created by the social media companies themselves) are currently the main instruments governing digital content and its propagation in the constellation of social media and digital intermediaries (Gorwa, 2019; Zancova & Dimitrov, 2020; Tyler et al., 2021). These forms of self-regulation, unfortunately, are often not much more than forms of 'digital washing' (Lavorgna et al., 2023), with social media operating in a context whereby the platform is commodifying users' content and data to make a profit (Johnson, 2017). In any case, they are still what mostly defines the relationship between social media platforms and their users, framing users' perceptions and practices, setting the boundaries of what content is allowed and what is not, and defining moderation and other governance mechanisms (Grimmelmann, 2015; Klonick, 2017; Gillespie, 2018). As such, social media responsibility in the context of the propagation of health-related information pollution is clear (as denounced also in the healthcare sector, see for instance The Lancet Oncology, 2020).

On the other hand – and this is the aspect we focus on in this contribution–, self-regulation is a core attribute of the learned professions, including many professions in the health sector. Self-regulation by professional bodies encompasses the authority and responsibility to establish and enforce standards of education, training, and practice. In the context of health-related information pollution, professional bodies have a fundamental role: while they should support the public engagement of their members, they also need to prevent the harms these might cause, and protect the right of the public not to be misled (Grimes & Greenhalgh, 2024, p. 635). Again, the challenge here is to find a balance between the protection of the public (needed, considering the social harms at stake) and the protection of the freedom of speech of the professionals implicated, especially when claims have been made in good faith (Grimes & Greenhalgh, 2024) – and so when misinformation, rather than disinformation, is involved. As effectively summarised by Grimes and Greenhalgh (2024,

p. 633), 'medical professionals, like all citizens, are entitled to their own opinion – but not their own facts': when healthcare practitioners make a health-related statement, there is an assumption from the public that they will reflect the scientific evidence on the matter; if they discuss a topic on which they lack specialist knowledge, or misrepresent that knowledge, 'they are betraying the trust which the public has placed in the medical profession and medical science' (*ibidem*).

Literature on this matter is still relatively scarce and is mostly based in the context of medical law (e.g., Davies, 2014, 2024), alongside internal discussions within the healthcare sectors themselves (e.g., FNOPI, 2013, 2018; FNOMCeO, 2023b; British Medical Association, 2024). Nonetheless, some regulatory bodies seem to be keen to intervene in the matter. Gimes and Greenhalgh (2024), for instance, report the efforts of the Federation of State Medical Boards (FSMB, which represents the 71 state medical and osteopathic boards of the United States and its territories), but also the tensions due to the strong US tradition of supporting freedom of speech through the First Amendment to the Constitution; as a consequence, for instance, a law passed in California in 2022 against misinformation by doctors was repealed only a year later after legal challenges from doctors asserting their First Amendment rights (on the relatively early attention on the US on the matter, see also Farnan et al., 2013). Other bodies seem to be more silent on the issue, while operating in a different constitutional context. In the remainder of this contribution, we will see how the debate is progressing in Italy and the UK (countries where previous comparative studies on health-related information pollution were carried out, hence also furthering a preexisting research agenda – see Lavorgna & Horsburgh, 2019; Lavorgna & Myles, 2022), focusing on some recent key self-regulation initiatives.

Our Study

In Italy, the code of deontology of the Italian National Federation of the Colleges of Physicians, Surgeons and Dentists (FNOMCeO) contains the principles and rules to which every professional medical practitioner working in Italy must adhere. The code, which was originally created to regulate intra-professional conduct and promote the interests of the medical category, was subject over time to several revisions to adapt to socio-technical innovations; nowadays, it largely focuses on the relationship with the patients (as described in Patuzzo et al., 2018). A new proposal for recommendations on the use of social media, emails, and instant messaging in the medical profession and for doctor-patient communication was recently published (FNOMCeO, 2023a) and presented with a press release (2023b). There has been a similar initiative also by the Italian Scientific Society of Anaesthesiologists, Intensivists, and Pain Therapists, together with the Italian Society of Legal Medicine, which recently published a separate document to emphasise the core principles that members of the medical community should follow when divulging health-related information, stressing how also digital communication should follow the same ethical and deontological principles characterising the profession (SIAARTI, 2024). A few years earlier, the Italian National Federation of Nursing Professions (FNOPI) published a document (2013) and a declaration (2018) on the use of social media by its members.

In the UK, the General Medical Council (GMC) is responsible for setting and maintaining the standards of care and behaviour that doctors, physician associates, and anaesthesia

associates must adhere to (GMC, 2024a). Part of their role also includes investigating and taking appropriate action in response to concerns around patient safety and the risk of damaging the public's confidence in doctors. Also, the GMC has recently published some guidance specific to social media use (2024b). Similarly, the NHS (NHS England, 2024) and the Nursing and Midwifery Council (NMC, 2023) have published guidance respectively for general practitioners (GPs) and GP practices, nurses, midwives and nursing associates who have an online presence.

Of course, in both the countries considered there are other representative bodies and actors with a core role in health matters (including other self-regulating relevant professions, such as pharmacists – see Foong-Reichert et al., 2022) that intervened in the debate, including with press news (see, for example, FNOPI, 2021), or at the local level. The associations selected, however, are those linked to some prominent cases of health-related information pollution in both countries; their codes, guidelines and declarations mentioned are those with national relevance, and those that – to the authors' knowledge – explicitly addressed the issue of digital communication in the context of a self-regulatory initiative.

For our contribution, we analysed the above-mentioned documents (the professional guidelines/codes of practice) through qualitative framing analysis, which is an analytical approach commonly used in constructionist research. In its contemporary applications, framing analysis emphasises the deliberate selection of information in defining problems, diagnosing causes, suggesting remedies, or making judgments: through selection, some aspects are emphasised, others are obscured (Entman, 1993). As such, framing analysis helps us to determine how the presence or absence of information creates meaning (Perkins, 2005). Framing analysis is generally applied to media and political discourse (Hertog, 2001; D'angelo & Kuypers, 2009; McIntyre et al., 2016; Foley et al., 2019), also in the context of criminological research (as recently evidenced and summarised by Matthews, 2024). In our work, we applied its principles and rationale to the documents and declarations mentioned earlier. These types of outputs are not the usual target of framing analysis; nonetheless, we consider them in this context as the main relevant outputs produced by key stakeholders, able to frame and impact the debate on health-related information pollution online, and the ideation of potential prevention and remediation strategies.

Results and Discussion

Descriptive Results

The document published by FNOPI (2013) can be welcomed as pioneering in addressing the importance and the challenges of social media communication for healthcare practitioners, but it does not address the issue of information pollution; it refers to problematic content posted online only with reference to the publication of offensive or unprofessional content that might negatively impact the reputation of the nursing profession and institution. Similarly, the 2018 declaration (FNOPI, 2018) stresses that online communication affecting the personal 'decorum' or the 'professional prestige' (for instance because it fosters discrimination, or it does not foster collaboration with other colleagues in the healthcare sector) is against professional deontology and exhorts the professional order to intervene with disciplinary sanctions when needed.

The ICT Working Group of the FNOMCeO (2023a) elaborated a document defining the motivations about the need to have a social media regulation for the Federation and suggested a list of 16 recommendations to be potentially integrated in the code of deontology, in its part focusing on digitalisation. More specifically, in the document analysed, there are three sets of recommendations: the first one focuses on social media use; the second one on the use of emails in patients/doctors' communication; and the third one on the use of instant messaging (such as WhatsApp). Only the first set of recommendations is relevant for the scope of this contribution.

Interestingly, before presenting its original recommendations, the document presents a condensed summary of the main recommendations on the issue already developed by other relevant associations (including the BMA and the FNOPI, but also the American Medical Association, the American College of Physician, the Canadian Medical Association, and the Australian Medical Association). Altogether, these associations: emphasise the need for data confidentiality; encourage doctors not to accept 'friendship requests' by patients, and to create separate personal vs. professional profiles; ask doctors to be explicit about potential conflicts of interest in their posts; and to avoid insulting or ambiguous content. The possibility that a doctor presents a 'less effective' remedy because of personal gain is listed as an example of conflict of interest, hence presenting this behaviour only in the specific context of a doctor who 'could be bought' by a charismatic drug rep bearing financial benefits (rather than in the context of information pollution potentially linked to one of the other motivations as discussed for instance in Lavorgna & Horsburgh, 2019). The content of social media communications, on the other hand, is discussed in the final point. Also in this case, however, there is only a thin reference to 'fake news' in the recommendation as initially listed (p. 5), and such reference disappears when the recommendation is discussed (p. 8). Rather, the focus here is on the importance of avoiding posting offensive content, and it is stressed that digital content can be easily 'misunderstood' because of the lack of body language and the use of emoji.

Similarly, the original recommendations listed (p. 9) do not address explicitly the problem of information pollution, with the exception of Recommendations n. 5 ('Make sure that the content promoted via social media posts is scientifically valid') and, partially, n. 13 ('Before publishing a post, consider how its contents will be perceived by citizens, and the consequences these might have'). The focus of the original recommendations is rather on reminding doctors about issues of privacy and confidentiality, and on suggesting cautious behaviour online. It is also suggested that the guidelines are to be reconsidered every two years (p. 3), and that specific training should be provided under the FNOMCeO's aegis (p. 5). The press release accompanying the document analysed (FNOMCeo, 2023b), which reports some snippets of declaration of FNOMCEO representatives, confirms the attention posed by the Federation on the issue of social media communication; also in this case, unfortunately, 'fake news' seems to be listed once again only as a buzzword. The risks listed are those of negatively impacting on the doctor-patient relationship and to be subject to legal actions; social harms are not discussed.

The following year, the SIAARTI (2024) published an expert opinion focusing on five core statements. The underlying idea is that, while there are clear standards (a 'gentlemen's agreement' – p. 4) regulating the publication of scientific results and their divulgation, the advent of social media changed the scenario, leading to more interactions between doctors and researchers (including those looking for new 'customers' or chasing a micro-celebrity

status) and the general public. Despite the obvious merits of this democratisation of medical knowledge, it has also led to the increased visibility of information pollution, with the general public being unable to properly filter and assess technical content.

In line with the proposed recommendations, doctors (1) should be guided by informed consensus-inspired principles (which includes being cautious in divulging information, avoiding potentially misleading claims); (2) only divulge health information where there is clinical validation and scientific consensus, acting in agreement with the relevant ethical committee; (3) keep in mind that digital communication has to respect the same guidelines currently regulating other types of communication (relevant to this point are the articles of the code of deontology regulating scientific dissemination); (4) consider that, when online, communication needs to be particularly careful as health-related information becomes targeted or otherwise accessible to individuals without the necessary technical competence to understand it in its complexity (as such, self-promotion is allowed, but it should rely on communicative strategies that do not hinder the authority and credibility of evidence-based content); (5) remember that scientific dissemination via social media should follow the same standards of traditional dissemination (for instance, doctors should refer to proper sources to support the claims made), or the claims made should just be considered as personal opinions (SIAARTI, 2024). The document also laments the lack of national guidelines and training on scientific dissemination, especially online (*ibidem*, p. 9).

In the UK, there are some clear parallels to the Italian guidance. For example, the Nursing and Midwifery Council discuss how 'The Code' emphasises that nurses and midwives should 'use all forms of spoken, written and digital communication (including social media and networking sites) responsibly' (NMC, 2018). When applying the code to their social media guidance, the emphasis is very much on issues such as avoiding: the sharing of confidential information, pursuing relationships with patients, encouraging violence or self-harm, and so on. However, their social media guidance explicitly states that any information shared by practitioners on social media must be evidence-based and correct. The guidance also states how practitioners need to declare any conflicts of interest related to content posted on social media; for example, where it relates to financial or commercial dealings (NMC, 2023).

There are similar guidelines for doctors too. According to the GMC (2024a, b), medical professionals must make sure that any information communicated is not false or misleading. Specifically, the standards state that medical professionals must not deliberately leave out relevant information and must not present opinion as established fact. The GMC (2024b) has further stipulated that, when communicating online, medical professionals must not take advantage of people's vulnerability or lack of medical knowledge, must not misrepresent their experience and qualifications, and must declare any conflicts of interest.

When advising GPs (and GP practices) in the UK, NHS England (2024) acknowledge the many benefits of having a social media presence and encourage GPs to develop an effective social media strategy. However, the guidance also refers practitioners to the GMC guidance discussed above and highlights to practitioners that if someone identifies themselves as a healthcare professional or organisation, then they are likely to be viewed as trustworthy by the public and will thus be seen to represent the views of the profession. They also discourage practitioners from commenting on issues that they do not hold expertise or qualifications in. They, like the GMC, also remind practitioners that the standards they are expected

to operate by do not change, whether communicating online or in-person (NHS England, 2024).

Summarising the Frames

Overall, in both Italy and in the UK, we found that issues related to social media communication are framed with the primary interest of data confidentiality, patients' consensus, and professional reputation in mind. This idea is further reinforced when existing legal obligations, potential legal sanctions (in the Italian case) or disciplinary actions of healthcare practitioners are mentioned. For example, NHS England (2024) states: 'Communication on social media can be shared widely and may impact professional standing. Falling foul of these recommendations could result in disciplinary action'. In all the outputs considered, there is a basic agreement that existing guidelines on digital communication by healthcare practitioners is scarce and further guidance and training would be needed, but this criticism is met by a very timid approach. Problems related to unprofessional content are mostly explicitly linked to potentially *offensive* content, as in the case of potential defamation, discrimination or harassment. There are references to *misleading* content, but again the common frames informing the document analysed refer to the potential social harms produced only *en passant*, mentioning for instance the potential negative implications on public trust (with an emphasis on the negative impact on the profession in Italy, and on the public in the UK). While some general references to 'fake news' are present, all the outputs produced by the healthcare associations considered avoided taking a clear stance on the issue of information pollution created or promoted by their members. Rather, the issue of (lack of) medical literacy by the general public is mentioned, implicitly shifting the onus (or the shortcoming) elsewhere. Hence, while there are some guidelines that could be used to prevent medical professionals from creating and sharing information pollution online, these could be more explicit, and more clearly discourage practitioners from doing anything that can harm not only public confidence in the medical profession (and subsequently public health), but also specific individuals.

Issues with Self-regulation and its Implementation

Even when guidelines are relatively clearer (as in the case of SIAARTI and the GMC), their implementation in both countries might not always be effective because of cultural factors. For example, Grimes and Greenhalgh (2024) have recently discussed how the UK General Medical Council has at times suggested that investigations against high-profile doctors who make anti-vaccine statements could amplify their reach further because of the resonance of the case, even if there is no evidence of this. Conversely, it might be claimed that a rebuke from the regulator might send a clear signal to the public, allowing the regulator to maintain credibility, and potentially mitigate social harms.

In both countries, these cultural factors are likely linked to the origin and development of medical (self)regulation, perceived as potentially problematic and contentious since the inception of the social contract between the state, the public and the professions (consider, among others, Pulice, 2015; Conti, 2017; Giarelli, 2020 for the Italian case; Davies, 2014; Dixon-Woods et al., 2011; Tazzyman et al., 2019 for the UK). Since the beginning, the core idea was that the profession, in return for its self-regulating privileges, would control

entry into the profession, acting as a reliable guarantor for the competence and conduct of its members. Unfortunately, as discussed in detail by Dixon-Woods and colleagues (2011), such a model has always left the profession vulnerable to the problem of 'bad apples'. A partial erosion of self-regulatory powers in the UK and a number of changes and modifications of both the professions and the healthcare system in Italy (now a jumble of separate regional systems differentiated along organisational and strategic lines – see Giarelli, 2020) have left a number of open critical issues (in Italy, for instance, the opacity of disciplinary actions remains a key concern - Pulice, 2015, p. 13), probably in the effort to resist the pressures of an ever-increasing external accountability (Englund & Solbrekke, 2014).

An analysis of the specialised tribunals overseeing self-regulations would have exceeded the scope of this study, but existing research suggests that, in the attempt of drawing boundaries between what is acceptable and what is not when it comes to professionally appropriate freedom of expression, they tend to side on doctors' sides, without risking interference with their rights (for a recent analysis of British cases, see Davies, 2024). However, this approach is not consistent, and in other cases, where the trust the public should be able to place in doctors was considered breached, were found to constitute misconduct (*ibidem*). Also, in other countries, disciplinary responses against healthcare professionals promoting and disseminating health-related information pollution appear inconsistent, with ineffective reprimands that are then challenged because of their obvious tensions with the right to free speech (for instance, regarding Canada see Foong-Reichert et al., 2022). These uncertainties are negatives also for doctors themselves, who might decide to err towards remaining silent when deciding whether they can enter debates on controversial topics (Davies, 2024). This is important because our society is negatively affected if healthcare professionals refrain from speaking openly, as this might undermine scientific debate and put patients at risk (*ibidem*).

Additionally, even when disciplinary sanctions are inflicted, there are issues concerning their effectiveness. For instance, as lamented by a representative of the Italian Medical Association during a media interview (Nicolussi Moro, 2023), existing regulations are deeply ineffective: even if doctors are fired, or suspended or even expelled by the Order of Doctors, they can mostly continue to work – either via private practices, or because they can appeal the decision and be operative in the meantime. Indeed, they can appeal first to CCESP (the Central Commission for Health Practitioners) – a sort of special 'appeal court' for health practitioners – and then, potentially, to the Italian Supreme Court; but this judicial system is clogged, and in practice it fails in its function of both general and specific deterrence. In the UK there are also examples where doctors continue to work after a disciplinary action, for example by moving to a different country. Mr Mohammed Adil (one of the cases discussed in Davies, 2024; see also Dyer, 2023) has been erased from the GMC register as a result of spreading information pollution about the pandemic and vaccines, but now operates in Pakistan, from where he continues to divulge his pseudoscientific ideas (as easily emerges from a search in the open web).

Conclusions

In this contribution, we highlighted how the creation and dissemination of health-related information pollution has been investigated as a topic of multidisciplinary concern, including for criminologists. Specifically, by relying on a social harm approach, it is possible to overcome the limitation of legalistic approaches, and rather to look critically at the mismatch between the regulatory attempts and the societal needs to be addressed. Furthermore, such an approach helps to look beyond issues of primary victimisation to consider also the broader consequences of healthcare mis- and dis-information on public health (in terms, for instance, of mental health, vaccine hesitancy, and health care decision-making – Kisa & Kisa, 2024), institutional trust (towards public health authorities and medical professionals, but also more in general towards governments and criminal justice systems – Reid et al., 2024; Štětka et al., 2024), and even digital governance (Warnke et al., 2024).

The COVID-19 pandemic, being the first pandemic of the internet age and thus subject to magnified mis- and dis- information (to the point that the term 'infodemic' became part of common jargon), forced many to acknowledge the existence of widespread health-related information pollution, also by healthcare professionals. Nonetheless, there is still scarce literature addressing this problematic aspect of information pollution. Our work contributes to addressing this research gap from a novel disciplinary standpoint, evidencing the tensions behind the creation and propagation of health-related information pollution by healthcare practitioners. The creation and dissemination of health-related information pollution by healthcare professionals occurs nowadays in a context of ever increasing hyperspatialisation of our lives, with blurred boundaries between our online and offline identities, and between our personal and professional selves, especially online. How we speak or express ourselves, also online, warrants protection, and finding new balances between freedom of speech and expression online and the need to avoid harmful content is possibly one of the most complex contemporary challenges. Unsurprisingly, actions taken against information pollution in this context are particularly difficult to ideate and implement.

Through a comparative and contrastive framing analysis of current regulatory practices in both Italy and the UK, we discussed how contemporary discussions within healthcare professions in both countries are recognising the existence of specific sets of challenges when it comes to digitally-mediated communication by their members, but they still fall short in assuming responsibility in the context of information pollution, at the risk of losing credibility. Yet, healthcare professionals, even in online communications, are in a position of power over patients, and are in control of the fiduciary nature of their relationship. Overall, even if our analysis focused on two specific examples where key self-regulation initiatives were recently adopted or discussed, it suggests the existence of a broader ferment around the need and opportunity to update and adjust self-regulations by professional bodies over the evolving use of digital and social media – an issue of global relevance, and potentially with global implications (the potential audience of a prominent professional can easily exceed jurisdictions).

Besides professional orders, researchers have also tried to suggest a number of measures for healthcare practitioners to better prevent and counter information pollution. Neylan and colleagues (2021), for instance, in addition to the general advice of being careful when posting online, provided some more detailed guidelines, such as regularly updating hardware and software for cybersecurity purposes and, more generally, receiving sufficient cybersecu-

rity training; reporting information pollution to social media companies; reporting security breaches; back-up documents so that the originals can be used to refute those altered in disinformation campaigns; and being specifically prepared to deal with information pollution in its various manifestation (for instance, by being prepared to speak out about those in the medical profession who spread conspiracies, cross-checking information with multiple sources, and using compassion and empathy rather than mere facts or argumentation to counter conspiracy). Interestingly, some of these ideas – not present in the output analysed by us – seem to encourage a broader cultural change, rather than focusing on issues of data confidentiality, patients' consensus, and professional reputation. The proposed approach brings together better awareness of both basic cybersecurity principles and outreach communication, empowering healthcare practitioners while cultivating a sense of responsibility.

Indeed, healthcare professionals can also play an important role to counter information pollution online, acting as 'public health pedagogues' (Thompson, 2023) to debunk information pollution while promoting science-based education about medical facts. As exemplified by Thompson (2023), platform affordances could be effectively used to encourage audiences to protect the health of themselves and others. Of course, this is not an easy task, as there are complex and deep-rooted social and political drivers behind information pollution that cannot be comfortably dismissed 'by simply blaming technology' (Bruns, 2019, p. 7), and hence cannot be solved by simply consciously weaponising the same technology for the social good. Some training in science communication, however, could be beneficial – if not to use affordances, at least to communicate effectively within their framework. Indeed, researchers have consistently showed how some communicative strategies can be ineffective, or even further harmful. For instance, acting as elitist experts while belittling misinformation, actors can have the opposite effect (Thompson, 2023). Similarly, 'cold' fact-checking, is not helpful in altering beliefs and actions (Nyhan & Reifler, 2010; Bardon, 2019); empathy and understanding, rather than argumentation, work better (Abbassi, 2021).

Any effective method of deterring healthcare practitioners from sharing information pollution in future needs to be a concerted effort. First of all, considering the complexities behind any regulation and its implementation governing an issue at the intersection of law, ethics, medicine, and other fields of research (combined with the fact that professional tribunals tend to be reluctant in drawing from expert evidence when dealing with these complexities – see Davies, 2024), modifications to ethical codes could benefit from a more open interdisciplinary dialogue (Pulice, 2015, pp. 14–15). Moreover, international standards and better forms of cooperation might help prevent the ineffectiveness of the existing sanctioning system. But regulatory intervention is not enough.

In line with Davies (2024), we argue that healthcare practitioners should receive (more effective) education regarding scientific epistemology, and the appropriate approaches to evidence-based scientific debate. They should also be trained to better communicate with their patients when exposed to disinformation, and be informed of current mis/disinformation trends in order to be in the best position to help their patients, who could have been exposed to dangerous narratives (on this, see also Neylan et al., 2021). While it is important not to prevent healthcare professionals from challenging accepted wisdom when there is growing evidence to contradict it, there needs to be awareness of the importance of weighing up the benefit of sharing something against the wider impact, including the impact of information overload on the public's ability to make informed decisions about their health and their faith in medical professionals.

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