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## Tracking biomedicalization in the media: Public discourses on health and medicine in the UK and Italy, 1984–2017

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## ABSTRACT

This article examines historical trends in the reporting of health, illness and medicine in UK and Italian newspapers from 1984 to 2017. It focuses on the increasing “biomedicalization” of health reporting and the framing of health and medicine as a matter of technoscientific interventions. Methodologically, we relied on two large datasets consisting of all the health- and medicine-related articles published in the online archives of *The Guardian* (UK) and *la Repubblica* (Italy). These articles underwent a quantitative analysis, based on topic modelling techniques, to identify and analyse relevant topics in the datasets. Moreover, we developed some synthetic indices to support the analysis of how medical and health news are “biomedicalized” in media coverage. Theoretically, we emphasise that media represent a constitutive environment in shaping biomedicalization processes. Our analyses show that across the period under scrutiny, biomedicalization is a relevant, even if sometimes ambivalent, frame in the media sphere, placing growing centrality on three dimensions: i) health and well-being as a matter of individual commitment to self-monitoring and self-surveillance; ii) biomedicine as a large technoscientific enterprise emerging from the entanglement between research fields and their technological embodiments; iii) the multiverse reforms of welfare systems in facing the trade-off between universal health coverage and the need to render the national healthcare system more sustainable and compatible with non-expansionary monetary policies and austerity approaches in managing state government budgets.

## 1. Introduction and theoretical remarks

In the late 1990s, considering the substantial technoscientific re-shaping of contemporary biomedicine, medical sociologists questioned some of the key assumptions of medicalization theory (Conrad, 1992, 2005, 2007), which traditionally represented one of the most significant frameworks for scrutinizing changes in the relations between medicine and society. In this regard, Clarke and colleagues proposed the “biomedicalization theory”, with the aim of emphasising how, beginning about 1985 (Clarke and Shim, 2011, p. 180), medicine and life sciences start to coalesce and transform “from the inside out through old and new social arrangements that implement biomedical, computer, and information sciences and technologies to intervene in health, illness, healing, the organisation of medical care, and how we think about and live life ‘itself’” (Clarke et al., 2010a, p. 2).

Biomedicalization is located within the epistemic realignment of the “clinical gaze” (Foucault, 1973) with the “molecular gaze”, which

permeates contemporary clinical routines (Rose, 2007). The “technoscientization” of medicine (Wehling, 2011) is shaping a new “biopolitics”, encompassing circuits of vitality in which molecular entities of life can be mobilised and arranged to open new forms of care: “optimisation”, “susceptibility” and “body enhancement” (Lemke, 2007; Clarke and Shim, 2011).

Under this perspective, analytical sensitivity has turned towards the study of new emerging possibilities for “enhancing” and “optimising” life itself as well as the technoscientific re-organisation of biomedical knowledge (Clarke et al., 2010b). This is a broad perspective proposing novel analytical lenses to capture general social changes of 21st century medicine concerning the bio-politics of life, the conditions of access to healthcare services, the lifestyle transformations via (self)surveillance techniques and the emergence of new bio-economies (Novas and Rose, 2000, Novas, 2006; Rabinow and Rose, 2006).

Referring primarily to the USA, Clarke and co-authors argued that the rise of scientific medicine occurred between 1890 and 1945. In this

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period of time the US medical sector has been fully consolidated: we need only think, for example, that even during the Great Depression, Americans spent over \$3.5 billion annually on medical services (see Clarke and Shim, 2011, p. 179). The medicalization era covers the period between 1940 and 1985, marking the exponentially expansion of the medical jurisdiction within several social domains. Only since 1985 we can see the first harbinger of the major technoscientific changes in the constitution and practices of contemporary biomedicine, which mainly occurred in the two following decades, opening up the biomedicalization era, as the emerging outcome from the mutual interdependence of five major trends (Clarke et al., 2003, 2010a; 2010c):

- i. a political economic shift towards the constitution of the so-called Biomedical TechnoService Complex, Inc. as a new socio-technical form of organising and commodifying the health sector on a global scale. Hence, the biomedical research, outcomes and services are increasingly corporatized, rather than state-funded;
- ii. a radical turn towards a proactive biomedical intervention in health (in addition to injury, illness and disease) as well as a redefinition of the risk and surveillance technique in biomedicine. Health is increasingly conceived as a moral obligation and an individual goal, which ought to be pursued not only through appropriate lifestyles but also via technical means;
- iii. The constitution of biomedical practices in terms of a technoscientific assemblage of bytes, computerised databases, genomic technologies and molecular entities as “actionable tools” for the treatment and enhancement of the living body;
- iv. New configurations in producing and sharing biomedical knowledge across different places, especially the Internet, which reshape the boundaries between lay and expert knowledge;
- v. Transformations of living bodies and shaping of new individual identities, fostering collective forms of bio-socialities.

Biomedicalization processes deploy a broad range of trends, including the commodification of health, the development of new risk forecasting models, the increasing relevance of molecular diagnostic tests and an even closer relationship between scientific laboratories, clinical settings and the marketplace. Body interventions are not only performed by medical professionals but also by each of us through “technologies of the self” (i.e. self-tracking apps; see Lupton, 2016) as a form of self-government of health.

In their study on biomedicalization and newspapers coverage of health and medicine, Hallin et al. (2013) argued that “these developments increase the range of social interests that are affected by and implicated in the field of health and medicine, and thus increase both the potential for public controversy and range of actors prepared to intervene in it” (p. 121). Indeed, in everyday life people are exposed to a plurality of information about health. Newspapers circumscribe an informational landscape to their experience, promoting diverse implicit or explicit messages on how to take care of living bodies. Thus, media are an important resource for gaining “somatic expertise” (Rose, 2007, p. 6), disclosing and legitimising new sub-professions (e.g. specialists in reproductive medicine, stem cell therapists, genetic counsellors), which act as new “pastoral experts” responsible for communicating on health issues (Seale, 2002).

In the context of biomedicalization media play a pivotal role not only in popularising or driving biomedicalization processes, but also in constituting complex “healthscapes” (Clarke, 2009, 2010a) which actively intervene in producing, re-producing or contrasting these processes. In this sense, media can be seen as layered contexts of things, people and assumptions, contributing to co-shaping biomedicalization, with “biomedicine as culture per se as regime of truth” (Clarke et al., 2003, p. 163).

As highlighted by Cartwright (1998, p. 220), “medicine is a culture field whose meanings are created not only by the elite managers of technoscientific laboratories and research centers, but also through the

intervening forces of popular media and by media activist counter-cultures”. Generally speaking, public narratives can shape, reproduce and reinforce what seems possible (knowledge) and desirable (imaginaries) as well as what seems appropriate or inappropriate (norms, values and beliefs). Therefore, not only can media influence the agenda of public discourses or reflect what is going on in certain biomedical fields; they are also influenced by social actors and relevant stakeholders (such as policymakers, researchers, patient organisations and NGOs) as crucial “makers” of information and meanings. Accordingly, contemporary media are generative elements engaged in the exchange, reproduction and transformation of the (social) meaning of health- and medicine-related content (Altheide, 2013). Therefore, the analysis of media can be two-fold: on one hand, media can be observed as agents contributing to the development of social processes; on the other hand, they represent a source of data for studying those processes.

The fact that the emergence of “technoscientific biomedicine” resulting from the intertwining of science and technology may have serious social and cultural impact has been debated in recent years (Burri and Dumit, 2007). The present article explores the biomedicalization process, developing a comparative study concerning medical and health accounts in *la Repubblica* (Italy-based newspaper) and *The Guardian* (UK-based newspaper), with particular attention on the extent to which media narratives have become “biomedicalized”. In order to capture the variety of situations that the biomedicalization is asking to investigate, we selected these two newspapers since they paradigmatically exemplify diverse cultural, economic, geographic and political contexts in Europe, also accordingly to different welfare state models (i.e. “liberal” in UK and “Latin” in Italy, see Saint-Arnaud and Bernard, 2003; Raphael and Bryant, 2015), to which health outcomes are related. We are aware that these two broadsheet newspapers are not representative of the overall media ecology existing in UK and Italy. Even so, the fact that they are two elite newspapers makes them particularly attentive to question medical and health issues, and due to their peculiar similarity (in news framing, in the editorial policy and line, and in the audiences) they are undoubtedly suitable to develop a consistent comparative analysis. Furthermore, both newspapers have a large online available repository, which allowed us to shape a dataset exploitable in a coherent way with the selected methodological framework. Overall, we want to address the issue of biomedicalization, with particular reference to the European context, as an open theoretical and empirical issue, rather than as a taken-for-granted conclusion about the progressive technoscientific transformation of biomedicine “from the inside out”.

## 2. Methodological framework

### 2.1. Research questions

Our purpose is to provide an innovative understanding of the ways in which public discourses in mainstream media may embody particular representations of the emerging biomedicalization as a whole and, accordingly, to analyse the development of its constitutive dimensions over time. Considering the intersection of the five key processes around which biomedicalization is extending in our everyday experience, we identified three interrelated analytical areas, which will orient our comparative study.

First, we are interested in understanding how biomedicalization is reshaping contemporary forms of *governmentality* (Franklin, 2000; Prainsack, 2017) through the development of strategies of optimisation for the healthy living body. Health and the management of chronic illnesses are becoming individual moral responsibilities, performed via self-surveillance techniques embedded in a “culture of life” deeply rooted in the idea of individual perfectibility and enhancement (Knorr-Cetina, 2005, pp. 76–77). Because of new engines aimed at the maximisation of health quality, biomedicalization reflects a growing

emphasis on risk reduction and control in contemporary health and medical discourse (Sulik, 2011). Accordingly, our first research question (RQ1) is as follows:

*To what extent does media coverage show that health and illness status are increasingly becoming a matter of complex techno-moral performance of technoscientific identities, implying multiplies forms of risk (self)management?*

Second, biomedicalization scholars have argued that contemporary biomedicine is a highly technoscientific initiative. This is illustrated by the growing intertwining of clinics and scientific laboratories, where the aim is to quickly introduce, in clinical routines, new diagnostics, treatments and procedures from bioengineering, molecular biology, genomics, proteomics, etc. (Crabu, 2016, 2018; Cambrosio et al., 2018). Our second research question (RQ2) reads:

*To what extent does media coverage portray biomedicine as a strategic “high-tech” sector, deeply permeated by broader technoscientific innovation dynamics?*

In connection with this broad research question, we will also analyse the molecularisation processes enacted by the growing intertwining of biotechnologies, nanotechnologies, molecular biology and clinical medicine. To do this, we ask the following more specific sub-research question (RQ2.1):

*To what extent does media coverage show a (sub)molecular (rather than a molar) conception of life, in relation to the management of health and illness conditions?*

Third, at the core of biomedicalization theory, we found the reconstitution of a novel bio-political economy of life. Here, we are interested in exploring media accounts about the process of commodification and corporatization of health and illness, within which new private actors (i.e. biotechnology and pharmaceutical companies) play a pivotal role in reconfiguring health sector governance. Our third research question (RQ3) is:

*To what extent does media coverage show narratives and accounts about healthcare commodification and the emergence of corporatized and privatised players in offering and managing healthcare services?*

We argue that the combined exploration of these three substantive areas under the three RQs can allow us to (1) verify whether and to what extent biomedicalization processes are pervading health and medicine narratives in the public sphere and (2) to have a more in-depth understanding of the growing role assumed by the mainstream press in configuring contemporary biomedicine as well as its cultural, epistemic and bio-political authority. Addressing the above RQs is crucial, since the on-going biomedicalization drivers ought to be analysed over time in relation to their specificities, which may vary between countries in ways that still need to be explored empirically. Thus, following the RQs, we also aim to clarify how and to what extent biomedicalization and media are mutually interlaced, highlighting how biomedicalization processes are co-constituted via specific discursive moves acted out in the public sphere, assuming the press as a proxy (Neresini and Lorenzet, 2016).

## 2.2. Data analysis

Our analysis is based on two large datasets of all the health- or medicine-related articles found in the public archives of *la Repubblica* and *The Guardian*. These articles were analysed using quantitative techniques, namely through both a manual and iterative analysis of topics extracted by Latent Dirichlet Allocation (LDA; see Blei et al., 2003).<sup>1</sup>

The article selection was performed by searching the public archives of *The Guardian* and *la Repubblica* from 1984 to 2017, using the keywords “health OR medicine” [*salute OR medicina*]. The open repository “The Guardian Open Platform”<sup>2</sup> was used for *The Guardian*, while the open archive “la Repubblica dal 1984”<sup>3</sup> was used for *la Repubblica*. Articles with less than 50 characters were excluded because they were mainly short photo-gallery or video descriptions. The initial datasets included 195,640 articles from *The Guardian* and 84,849 from *la Repubblica*. Starting from these initial datasets, a subset of articles was selected using two different runs of LDA. In the first run, we extracted 50 topics for each dataset. All the topic descriptions, consisting of the top words per topic, were then manually scrutinised in order to select topics pertaining to the RQs: 12 relevant topics were selected in the case of *The Guardian*, while 10 were chosen for *la Repubblica*. The selected topics included three components: (1) explicit reference to healthcare, disease and illness issues; (2) explicit reference to healthcare and biomedical agencies and public funding for healthcare and biomedical research and (3) explicit reference to biomedical research and medical technologies. Health- and medicine-related content played a marginal role in most of the excluded topics, which were mainly connected to other issues, such as sport, or political, economic and financial news. Hence, the two datasets were refined to only include articles for which one of the selected topics was most relevant (in terms of topic proportion). In this way, through the first LDA run, the number of articles constituting the two datasets was reduced, respectively, to 57,716 for *The Guardian* and 15,242 for *la Repubblica*. These two more focused datasets were analysed through a second LDA run. Regarding the first and the second run, the number of topics for extraction was set to 50. Following the same approach adopted in the first run and using the same three inclusion criteria, the most pertinent topics were detected. Moreover, each topic was associated with the most pertinent RQs. Table 1 provides a summary of the results of this analysis.<sup>4</sup>

The trends over time<sup>5</sup> (year by year) of the relevant topics in the second LDA run were computed, making it possible to observe whether they developed according to the biomedicalization hypothesis. In order to gain more meaningful insights with regard to our RQs, we developed some indices (Table 2) to exploit a manually selected list of keywords. Each index allowed a score to be assigned to each article. The score relied on the frequency of occurrence of the keywords in the document and a normalisation based on the length of the article.<sup>6</sup> For example,

(footnote continued)

discover patterns of words in very large document corpora. Given a corpus as input, a topic modelling algorithm provides as output a set of “topics”, each of which is a group of related words, e.g. involving the same thematic issue. A probabilistic topic model is based on the assumption that each document in a corpus is generated by a set of topics, each of which is a probability distribution over the entire vocabulary (the entire set of distinct words occurring in all the documents in the corpus). See Di Maggio et al. (2013) for a discussion on topic models in the context of social science and possible relationships with social science theories.

<sup>2</sup>The Guardian open archive is available at <https://open-platform.theguardian.com/>. We used the option for non-commercial usage of the content. See <https://open-platform.theguardian.com/access/>.

<sup>3</sup>The la Repubblica archive is available at <https://ricerca.repubblica.it/>. Articles from 1984 to 2009 were collected through the la Repubblica archive. Articles from 2010 were gathered through a platform that we designed and developed as part of a project, which aims to implement automatic procedures for collecting, classifying and analysing digital web content to monitor science and technology topics.

<sup>4</sup>All the topics and related top-five keywords selected in the second round of LDA are detailed in Annex n. 1.

<sup>5</sup>For each topic, we computed the proportion of the number of words associated with (generated by) the topic in that year over the entire number of words in all the articles published in that year (see Mimno, 2012).

<sup>6</sup>The general formula for the index is:  $I(d) = 1/|W| \sum_{w \in W} TF(w,d)/B/(TF(w,d)/B + K)$ , where  $I(d)$  denotes the index value for document  $d$ ;  $W$  is the set

<sup>1</sup>LDA is a topic model, i.e. a machine-learning technique which aims to

**Table 1**  
Topics concerning biomedicalization.

		<i>la Repubblica</i> , Italy					
Topic Num.	Topic Label	Top three keywords	Related RQ	Topic Num.	Topic Label	Top three keywords	Related RQ
3	Governing NHS: financial sustainability of the public hospital system	Hospital; patients; NHS	3	5	Molecular oncology, genetic test and lifestyles	Tumour; cancer; tumours	2; 2.1
6	Private actors in healthcare	Private; sector; public	3	9	Mental health and lifestyles as factor of risk in the context of molecular medicine	Study; researchers; research	1
7	ICT and the reconfiguration of the healthcare system	Data; information; system	2	10	Health literacy at the nexus of self-responsibility and self-care	To be; can; case	1
8	War on cancer: the risky living bodies	Cancer; breast; women	1	18	Wellness, beauty and body care: optimisation and new bio-politics	Skin; aesthetics; hair	1
10	NGOs and charity engagement in healthcare	Care; social; people	3	19	Frontiers in healthcare: regenerative medicine, robotic surgery and rehabilitation	Intervention; patient; surgery	2
12	Biomedical knowledge on trial: risk and lifestyle	Research; study; found	1	20	Living tissues: transplants and bio-banks	Transplant; transplants; heart	2; 2.1
13	Food and life style	Food; diet; eating	1	23	Lifestyle choices and health risks	Risk; illnesses; diabetes	1
25	Biomedical innovations	Research; science; scientists	2; 2.1	26	Wellness and alternative medicine	Medicine; acupuncture; homeopathy	1
26	Smoked life: tobacco-related diseases	Smoking; tobacco; health	1	29	Healthcare governance and crisis of the welfare	EUR; millions; shopping	3
27	The new brain sciences and the management of the mind	Brain; sleep; stress	2	36	Prevention and biological citizenship	Health; Italy; physicians	1
28	Tackling health by fitness	Exercise; body; fitness	1	40	Governance of the national health system: a matter of budget	Region; regional; Councilor	3
35	Engaging lay people: the patient-centred care	People; work; support	1	46	Biomedical research and genomics	Cells; DNA; research	2
39	Governing the healthcare sector: private agents and the marketplace	Health; government; told	3				
44	Drugs design and the pharmaceutical market	Drug; drugs; patients	3				
48	Questioning the NHS: reform and governance	NHS; health; care	3				
49	The future medicine: ICT, robotics, AI and nanotech	Technology; mobile; space	2; 2.1				

**Table 2**  
List of the indices developed to analyse the content of the articles pertaining the selected topics.

Name of the Index	Keywords	Rationale
Molecularisation	DNA, mapping, sequenc*, molecular*, genom*, proteom*, pharmacogenomic*, gene, genetic*, genbank, genotyp*	To measure the coverage of issues concerning the integration of bio-molecular technologies in biomedicine
Individualisation	personalis*, individualis*, gene therapy, precision medicine	To measure the coverage of issues concerning the development of customised and personalised medical options
Risk	risk*, danger*, hazard*, damage*; harm*	To measure the coverage of issues related to risk in the context of health and medicine
To be at risk	at risk	To measure the coverage of issues concerning populations and individuals at risk of contracting problems primarily managed by biomedical science
Risk factors	risk factor, risk factors, risk-factor, risk-factors, risk condition, risk conditions	To measure the coverage of issues concerning health risk factors
Genetisation of the risk <sup>a</sup>	genom*, gene, genetic*, genotyp* <sup>b</sup>	To measure the coverage of issues concerning the reduction of health risk factors to the individual genome

<sup>a</sup> This index was calculated only in the articles in which the “Risk Index” was > 0. The term “genetisation” can be interpreted as an adaptation of “geneticisation”, first introduced by Lippman (1991) and later used to critically analyse the widespread tendency to define groups of people on the basis of their genetic characteristics as well as to reduce diseases, behaviours and psychological traits as a consequence of genetic polymorphisms (see Novas and Rose, 2000; Greaves, 2000; Zinn and McDonald, 2018). Here, “genetisation” denotes the presence of “geneticisation” as a media reference to health and illness.

<sup>b</sup> In the case of *la Repubblica*, there are some differences due to the linguistic specificities of the Italian language.

the more an article contains words such as “gene”, “genomics”, “DNA”, “molecular”, “sequencing” and “farmacogenomics”, the more it is supposedly related to a kind of “molecularisation”. The devised indices were applied to topics related to RQs 1, 2 and 2.1.

The index trends were computed for a shorter period (1994–2017) than those used for the topic analysis, because during the first 10 years (1984–1993) too few articles were rendered available by the online repositories of the two newspapers. Accordingly, the value of the indices was 0 or not sufficiently reliable, being calculated on less than 10 articles per year. In this respect, we can reasonably assume that this aspect has not significantly affected the analysis, since according to the Clarke et al. periodization (see the Introduction) “biomedicalization era” extends in a more substantial way starting from the mid-nineties, with a greater intensity during the 2000s.

In order to assure a consistent base to compute the indices, a three-year granularity was adopted. Both in the topic and index trends, the curves often showed some peaks that depended on variations in the number of articles and the actual oscillations in the coverage. The remainder of the analysis will focus on general longitudinal trends (not on explaining the peaks) in order to address the RQs.

### 3. Findings

#### 3.1. Overview of the UK press

The longitudinal study of the topic trends (Table 3), as well as the most relevant related-words displayed in Table 1, show the integration of the “biomedicalization framework” in accounting health and medicine narratives in *The Guardian*, although some ambivalences should be considered since few trends are not confirmed by statistical significance.<sup>7</sup>

(footnote continued)

of keywords; TF(w,d) is the frequency of the keyword w in document d; K is a parameter (in our analyses, it is set to 1.2); and B is a document normalisation factor that includes the document length. This formula is based on one of the components of the BM25 weighting scheme for ranking documents in IR (see Robertson and Zaragoza, 2009).

<sup>7</sup> The analysis of trends was carried out by fitting a linear regression model for each topic and by means of the modified version of the Mann-Kendall test for serially correlated data using the Hamed and Rao (1998) Variance Correction approach. With regard to the former, we computed the regression line; the slope of that line is, in the case of Tables 4 and 6, the mean increases in topic proportion in 1 year. A positive value in the slope column indicates an increasing trend, and vice versa; 0 means that trends are stable over time. R2 (i.e. coefficient of determination, ranging from 0 to 1) indicates the percentage of the

Generally speaking, all trends pertaining to RQ1 increased during the time frame under scrutiny, even if topic 8 trend should be regarded carefully being not statistically significant. Hence, the most notable change over time was the growing attention in the UK press regarding issues explicitly addressing the “lifestylization” of well-being (topics 12, 13, 26, 28) as a socially enticing way of managing risk factors (Lemke, 2007). This aspect corroborates the assumption of Clarke and colleagues concerning the achievement of well-being as a task primarily borne by the individual, whereby responsibility for maximising health quality (traditionally linked to top-down public policies) is gradually considered a matter of individual skills (also technologically mediated) in the form of self-monitoring and self-surveillance. Overall, this heightened attention in the UK press was also confirmed by the fact that the “to be at risk index” and the “risk factors index” keep a positive value over time (Table 4), thus suggesting that this issue maintains a regularly coverage in the mainstream media discourse.

Looking at the indices’ trends (see slope raw in Table 4), the picture depicted by health and medicine narratives becomes more ambivalent. Only three indices’ trends are confirmed by statistical significance (“molecularisation”, “risk” and “genetisation of risk”).<sup>8</sup> This outlines fluctuating trends: the attention of the media towards issues related to biomedicalization can increase contingently due to peculiar newsworthy events, then losing centrality with the emergence of other “hot issues”. As clearly demonstrated by Hilgartner and Bosk (1988), centrality and visibility within the media arena are achieved through a competition process, engaging different issues that could attract the attention of the audience. Therefore, as in the case of other cutting-edge scientific advancements (e.g. OGMs), after an influential “hype cycle” regarding the release of the results of the Human Genome Project (the so-called “gene hype”, see Wehling, 2011), the molecular discourse was gradually popularised and, thus, naturalised within the mainstream health narratives. In this respect, as Clarke and colleagues themselves emphasise, biomedicalization is not a “technoscientific Tsunami that will obliterate prior practices and cultures” (Clarke et al., 2003, p. 184–185). They admit that the meanings and emerging practices are negotiated in heterogeneous ways, also in media contexts, where confusion, resistance and other counter social and cultural forms can emerge or disappear from the foreground of mainstream media discourses.

(footnote continued)

variance of the variable to predict explained by the regression model. With regard to the latter, the Mann-Kendall test is a non-parametric test for detecting trends in time series (\*p ≤ 0.05).

<sup>8</sup> The “molecularisation index” is significant also for MK test.



**Table 3**  
Trends (1984–2017) of health and medicine topics in *The Guardian* (\*p ≤ 0.05).

Topic Num.	Topic Label	Slope	R <sup>2</sup>	Trend (F test)	Trend (MK test)
RQ1-Related Topics					
8	War on cancer: the risky living bodies	0.0001	0.11	+	+
12	Biomedical knowledge on trial: risk and lifestyle	0.001	0.53	+*	+*
13	Food and life style	0.0002	0.057	+	+*
26	Smoked life: tobacco related diseases	0.0003	0.46	+*	+*
28	Tackling health by fitness	0.0002	0.036	+	+*
35	Engaging lay people: the patient-centred care	0.0024	0.74	+*	+*
RQ2- & RQ2.1-Related Topics					
7	ICT and the reconfiguration of the healthcare system	0.0004	0.079	+	+*
25	Biomedical innovations	0.0001	0.00046	+	+*
27	The new brain sciences and the management of the mind	0.0003	0.15	+*	+*
49	The future medicine: ICT, robotics, AI and nanotech	0.0003	0.15	+*	+*
RQ3-Related Topics					
3	Governing NHS: financial sustainability of the public hospital system	-0.0004	0.12	-	-
6	Private actors in healthcare	-0.0002	0.01	-	-
10	NGOs and charities engagement in healthcare	0.0006	0.4	+*	+*
39	Governing the health care sector: private agents and the marketplace	-0.0005	0.01	-	-
44	Drugs design and the pharmaceutical market	0.0005	0.37	+*	+*
48	Questioning the NHS: reform and governance	0.0016	0.72	+*	+*

**Table 4**  
Index trends in *The Guardian* articles mainly concerning RQ1 (moving average; \*p ≤ 0.05).

Indices						
Years	Molecularisation	Individualisation	Risk	To be at risk	Risk factor	Genetisation of risk
1997/1999	0,011	0,004	0,091	0,022	0,003	0,033
2000/2002	0,009	0,003	0,092	0,028	0,003	0,025
2003/2005	0,007	0,002	0,093	0,033	0,004	0,017
2006/2008	0,007	0,003	0,087	0,036	0,003	0,018
2009/2011	0,007	0,005	0,075	0,035	0,003	0,019
2012/2014	0,005	0,005	0,066	0,029	0,003	0,014
2015/2017	0,006	0,004	0,077	0,032	0,004	0,016
slope	-0.0008	0.0003	-0.004	0.0012	0.0001	-0.0025
R <sup>2</sup>	0.79	0.23	0.69	0.29	0.10	0.69
test F	-*	+	-*	+	+	-*
test MK	-*	+	-	+	+	-

Notwithstanding this, a second remarkable change over time concerned the incidence of topic 35 “Engaging lay people: the patient-centred care” can be observed, highlighting recent actions undertaken by the NHS towards the development of the patient-centred care approach, whose aim is “to involve patients and their carers by giving people the power to manage their own health and make informed decisions about their care and treatment and by supporting people to improve their health and give them the best opportunity to lead the life they want” (NHS, 2018, p. 26).

Looking at the “risk index” in *The Guardian* articles related to RQ2 (see Fig. 1), it results to be steadily positive, so that “risk” can be regarded as a relevant frame when the media discourse concerns health and medicine focusing on technoscientific innovation. Although this index underwent a slow but steady decline between the end of the nineties and the first decade of the 2000s, there is a general positive trend in the last seven years, driven mainly by a renewed interest in “health promotion” public policies, which consider individual lifestyle as a major risk factor. Accordingly, this implied an increase in public policies and actions that support individuals in improving their health and well-being through attitudinal and behavioural changes (Tulchinsky and Varavikova, 2010). Under this perspective, and in line with the biomedicalization hypothesis, the “invisible” work of patients seems to assume a critical centrality, both in self-managing their own health status and in the context of institutional clinical and care processes, as highlighted in topic 35.

As mentioned above about the index trends in *The Guardian* articles related to RQ1, media narratives informed by a “molecular gaze” did

not appear particularly pervasive (see Fig. 2). Anyway, the “molecularisation index” regarding the RQ2-related articles has positive values over time and it shows a positive trend from 2011, a crucial year for the governance of red biotechnologies in UK, since Cancer Research UK launched the so-called Stratified Medicine Programme for mass genetic screening of cancers. This initiative attracted a great deal of media attention regarding the expectations of genomics-based medical technologies in the form of novel and effective medical options based on patients’ unique genetic profile (Prainsack, 2017). In this sense, even if molecularisation and genetization doubtlessly play a relevant role in reshaping the socio-technical meaning of biomedicalization, the extent to which molecularisation is entangled with the promises of contemporary biomedicine seems to depend on the very characteristics of overall technoscientific context. Indeed, if we focus attention on topic trends related to RQ2, their growth over time appears reasonably coherent with the biomedicalization perspective: our findings show the growing technoscientification of biomedicine, with a major role played by emerging systems of ICTs and nanotechnologies in transforming biomedical landscapes and the life sciences agenda (see topic 49). Moreover, the *Guardian* presented this movement as technology-driven medicine, articulated around the emerging areas of digital technologies with future potential, such as artificial intelligence (AI) and robotics. At the same time, the topic labelled as “biomedical innovation” remained stable over time, thus showing the strict traditional role of bench and fundamental research as a form of public legitimisation of allopathic Western medicine. The role of technoscience in reshaping biomedicine has also affected the core of the debate about the future of the brain

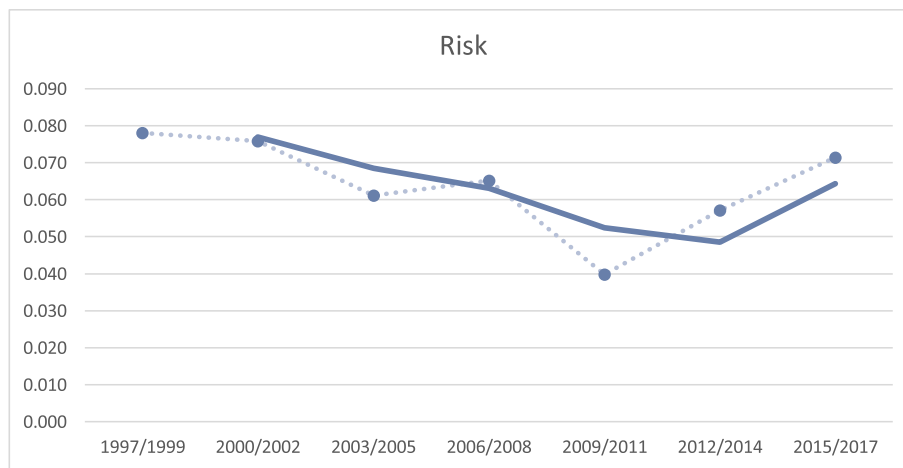


Fig. 1. Risk index trend in *The Guardian* articles mainly related to RQ2 (1997–2017). [moving average: slope =  $-0.0041$ ;  $R^2 = 0.633$ ; test F and test Mann-Kendall significant ( $p \leq 0.05$ )].

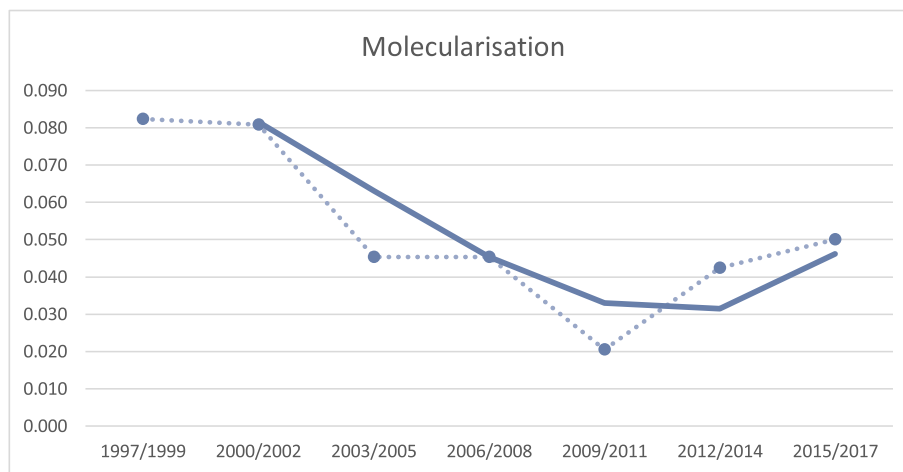


Fig. 2. Molecularisation index trend in *The Guardian* articles mainly related to RQ2 (1997–2017). [moving average: slope =  $-0.0085$ ;  $R^2 = 0.745$ ; test F and test Mann-Kendall significant ( $p \leq 0.05$ )].

**Table 5**  
Historical trends (1984–2017) in health and medicine topics in *la Repubblica* ( $*p \leq 0.05$ ).

Topic Num.	Topic Label	slope	R <sup>2</sup>	Trend (F test)	Trend (MK test)
RQ1-Related Topics					
9	Mental health and lifestyles as factor of risk in the context of molecular medicine	0.0015	0.59	+*	+*
10	Health literacy at the nexus of self-responsibility and self-care	-0.0006	0.065	-	-
18	Wellness, beauty and body care: optimisation and new bio-politics	0.0002	0.082	+	+*
23	Lifestyle choices and health risks	0.0005	0.41	+*	+*
26	Wellness and alternative medicine	-0.0001	0.0035	-	-
36	Prevention and biological citizenship	0.001	0.76	+*	+*
RQ2- & RQ2.1-Related Topics					
5	Molecular oncology, genetic test and lifestyles	0.004	0.40	+*	+*
19	Frontiers in healthcare: regenerative medicine, robotic surgery and rehabilitation	0	0.0002	=	=
20	Living tissues: transplants and bio-banks	-0.0001	0.067	-	-
46	Biomedical research and genomics	0.0001	0.012	+	+
RQ3-Related Topics					
29	Healthcare governance and crisis of the welfare	0	0.0012	=	=
40	Governance of the national health system: a matter of budget	0.0003	0.17	+*	+*

sciences (topic 27), in which science-based treatments are evolving towards a biologically based aetiology of mental disorder and the injection of ICTs in managing diagnostic practices (see [Orr, 2010](#)).

Lastly, the press did not focus heavily on the commodification of the healthcare system, thus marking a decrease over time of the topic regarding the role of the private sector in providing healthcare services (topic 6). The discussion about the need to reform the public healthcare

system became relevant in terms of rationalising service delivery and as part of new austerity measures. According to the data, NGOs and charities seem to be relevant in sustaining the overall healthcare system. These organisations are deeply rooted in cooperative relationships between professionals, healthcare stakeholders and lay people, along with the pharmaceutical sector (as pivotal actors in defining the drug market, as shown in topic 44). Moreover, following [Hallin et al. \(2013\)](#),

we see this as a form of subsumption of a competing knowledge system – a factor considered crucial by Clarke et al. (2003, p. 177) in boosting the biomedicalization. The process of co-optation of collectives of lay people by institutional biomedicine has also been marked by the growth of topic 35 concerning the definition of so-called patient-centred care, which is one of the most relevant policy frameworks in the UK according to the UK government White Paper “Equity and excellence: Liberating the NHS” (2010) devoted to “create a more responsive, patient-centred NHS” (Grosios et al., 2010).

### 3.2. Overview of the Italian press

Concerning the Italian case, the historical trends from 1984 to 2017 regarding health- and medicine-related topics are detailed in Table 5.

The majority of trends related to RQ1 have been increasing over time; the others are stable (topic 26) or, if decreasing, are not statistically significant, as in the case of topic 10 about health literacy. This last suggests that when addressed directly, the role of individuals tends to be less prominent.

Differently from what has been observed in the UK press, it is worth noting that in the Italian case the health stylization has increasingly been exposed to a “molecular gaze”, as demonstrated by the growing relevance of the “molecularisation index” in the articles of most relevance to RQ1 (Table 6). Similarly, the relevant references to risk – proven by the “risk index” values (Table 6) – appears to be consistent with the analysis by Clarke et al., especially when framed as a matter of individual concern: biomedicalizing practices imply new mandates to be embodied into one’s sense of self (Peterson and Lupton, 1996; Lemire et al., 2008), e.g. being (pro)active and prevention-aware (see topic 23). This historical trend outlined in our evidence is also accompanied by the growing centrality of health news, which frames patienthood within new forms of patient activism (topic 36). This opens the space for the formation of new forms of biosociality in which the individual experience of health and illness can be inscribed.

Also in the Italian newspapers, individuals, or communities of concerned people, are increasingly being called upon to enhance themselves by eating the right foods, keeping fit, or taking a genetic test to determine (see “molecularisation index” and “genetisation of risk index”) disease susceptibility or potential genetic issues in their unborn children (see Prainsack, 2017, p. 84).

All these aspects seem to be congruent with the permanent positive values of the “individualisation”, “to be at risk” and “risk factors” indices. This corroborates Zinn and McDonald (2018) affirmation that “the health domain has been identified as one of the key social domains where the notion of risk has become pervasive both in research as well as public debate” (p. 37). These authors have also provided evidence to show that there is “an increasing presence of the RISK FACTOR” and that such a tendency “is much more prominent in the health sector than

in other social domains” (p. 144).

Table 5 shows that the rising coverage of molecular biomedicine appears clearly in cancer-related topic (5) and in that concerning the genomics-based medical research (46), even if this last tendency is weakened being not statistically significant. But the general trend is confirmed by the “molecularisation index”, which shows a slightly increase in articles relating to these topics (Fig. 3). Conversely, interest in transplantation and tissue banks (topic 20) has been decreasing. It can be argued that there is a connection between the two trends: the space dedicated to the second issue by the media can be replaced by the attention to the first or, even better, by the promise that molecular biomedicine will help overcome the need for organ donations and tissue storage.

The relevance of technoscientific innovation (topic 19) remains stabilised over time, suggesting that emerging technologies and new scientific discoveries are accounted as crucial elements in the development of biomedicine.

The “risk frame” is more pervasive in RQ2-related topics (Fig. 4), even if the trend is not particularly pronounced, and thus not statistically significant.

This can be interpreted as a substantiation of the biomedicalization hypothesis, suggesting that media coverage of technoscientific research in medicine is routinely related to a risk frame, both on the side of people who are exposed to the risk of becoming ill and on the side of the increasing commitment of medicine to the early detection of such an event in order to impede it.

Finally, even if the attention regarding the governance of the Italian National Health System (SSN) in the context of the welfare state crisis (topic 29, Table 5) appears stable over time, we detected during the first ten years of the 2000s a growing attention over SSN governance, as a matter of budgetary concern (topic 40, Table 5). Noteworthy is the fact that in Italy, the weak turning towards a more central role of the private sector in the health domains is well confined within a general discourse about the problem of the financial sustainability of the SSN, and this is most frequently addressed in terms of regional rather than state governance (top three keywords topic 40: region; regional; Puglia – see Table 1). Hence, if the salience of the biomedicalization’s engines in accelerating the significance of the private sector is not so evident in the case of Italy, this might be at least partially related to the peculiarity of the Latin welfare system, where state still plays a prominent role in the provision of citizen’s health security and services (Raphael and Bryant, 2015).

## 4. Discussion and concluding remarks

Even if the entanglement of technoscience and biomedicine in media sphere is complex and sometimes ambivalent, we found many specific clues drawing a trend toward the “biomedicalization of the

**Table 6**  
Index trends in *la Repubblica* articles most related to RQ1 (moving average; \*p ≤ 0.05).

Indices						
Years	Molecularisation	Individualisation	Risk	To be at risk	Risk factor	Genetisation of risk
1997/1999	0.007	0.004	0.073	0.002	0.008	0.010
2000/2002	0.009	0.005	0.072	0.002	0.009	0.011
2003/2005	0.011	0.005	0.068	0.002	0.009	0.016
2006/2008	0.011	0.005	0.075	0.002	0.008	0.018
2009/2011	0.010	0.004	0.074	0.003	0.007	0.016
2012/2014	0.016	0.003	0.070	0.002	0.009	0.027
2015/2017	0.022	0.005	0.085	0.001	0.016	0.030
slope	0.0021	−0.0001	0.0014	−0.0001	0.0008	0.0033
R <sup>2</sup>	0.773	0.038	0.289	0.071	0.322	0.876
test F	+	−	+	−	+	+
test MK	+	−	+	−	+	+



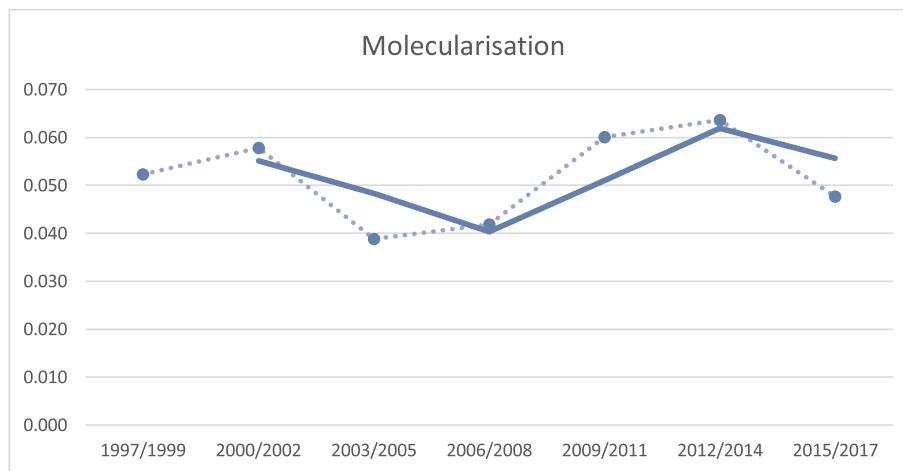


Fig. 3. Molecularisation index trend in *La Repubblica* articles related to RQ2 (1997–2017). [moving average: slope = 0.0010;  $R^2 = 0.110$ ; test F and test Mann-Kendall not significant ( $p \leq 0.05$ )].

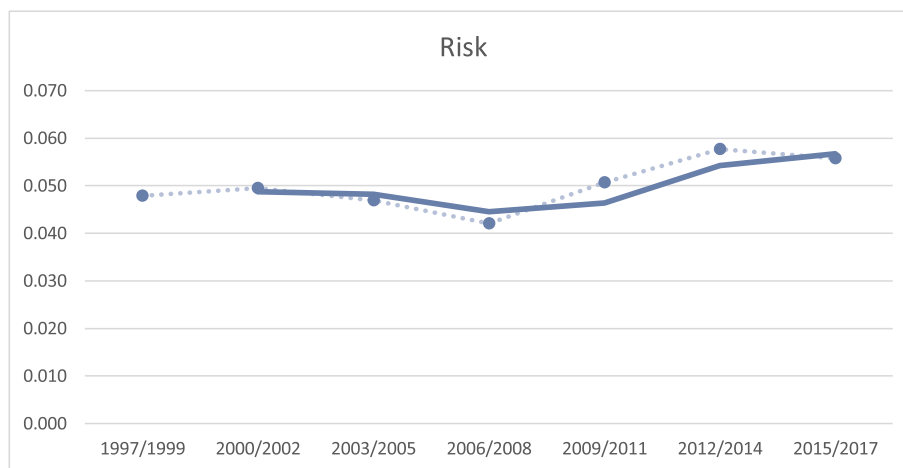


Fig. 4. Risk index trend in *La Repubblica* articles mainly related to RQ2 (1997–2017). [moving average: slope = 0.0013;  $R^2 = 0.429$ ; test F and test Mann-Kendall not significant ( $p \leq 0.05$ )].

press”: on the basis of the analysis over the media coverage about health and medicine reports in the UK and Italian press, we can argue that the biomedicalization process has become an increasingly significant frame. Not only does our research reveal several entangled topics that are clearly related to this process within the mainstream media discourse; they have also gained increasing relevance over time.

First, the paper shows that there is a relevant focus on “lifestyles” and that individuals are supposed to act responsibly in order to cope with the potential risks to which their health can be exposed (RQ1). This happens mainly when media are addressing cancer-related issues, for which the “risk factors” narrative is well established, often in terms of “being at risk” with reference to specific epidemiological population groups. At the same time, in accordance with the biomedicalization thesis, the increasing importance ascribed to individuals suggests that they cannot be relegated to the subordinate role of “patient”, to whom it is only required to be compliant with practitioners’ prescriptions. This is confirmed by the prominent presence of patients, their families and organisations within the media discourse – as active subjects in managing their own biomedicalization trajectory (see topics 10 and 35 for the UK case; and 36 and 18 for the Italian case). Differently from the UK, in Italy, this is significantly related to alternative medicine, the importance of which can be interpreted as a form of “interpenetration” of the biomedicalization with other system of knowledge and expertise. Hence, it is worth emphasising that the increasing attention by media discourses on the individual’s responsibility towards health, nudging

people to take care of their own well-being (Praisnack, 2018, p. 86), highlight a new focus on treatment of risks and lifestyles rather than discussing ever more diagnostic categories of illness.

Second, generally speaking, it becomes increasingly evident the framing of biomedicine as a large technoscientific enterprise: emerging research fields (robotics, nanotechnologies, AI) and their technological embodiments are strongly intertwined in the media discourse about health and medicine (RQ2 and RQ2.1). This happens both in the UK and Italy, even if in Italy the “molecular gaze” seems to be a more prominent lens to account for contemporary technologically-driven medicine. Thus, genetics and genomics are in fact more present and shows a slightly trend of increasing relevance in Italian media. There is, moreover, a declining interest in transplants and tissue banks, which seems to have been replaced by other emerging research areas, such as precision medicine. Conversely, within the UK press coverage more attention has been drawn to AI, and the importance of novel biological approach to brain sciences. At the same time, biomedicalization discourses appear in general to be interested primarily in technoscientific research with potential health outcomes and potentially relevant translational benefits, than in basic research that has long-term benefits.

Third, the transformation of healthcare systems does not seem to be represented in the media coverage in terms of extension of the responsibilities of for-profit actors and the progressive commodification of health; rather, it implies a prolonged public discussion on the

governance and sustainability of national health systems, within the general frame of the systemic crisis of the welfare state. This can be related to the fact that mainly US represented the context of reference for the development of the biomedicalization theory, where private stakeholders and health insurances companies gained a pivotal role and where the public national healthcare system is less universalistic than in the UK and Italy, even if in US the state – together with biotech companies – supports consistently the scientific research in the medical field.

Starting from our evidences, we can argue that – differently from the analysis of biomedicalization in US – the strengthening of the corporate (instead of the state-funded) nature of biomedicine is mitigated by the power of the state in devolving to public local authorities (see topic 48 in UK and 40 in Italian) and semi-autonomous regulatory bodies (such as bioethics commissions) responsibilities for the management of human health. Doubtless, this is a peculiarity related to the organisation of the European welfare state, where the levers of the biomedicalization still seem to be primarily managed by public governmental bodies (see Raphael and Bryant, 2015). However, this does not prevent emerging forms of bio-capital accumulation, where the capital itself is re-organized by means of hybrid linkage with the life sciences, technologies, and institutions including the state and corporate pharmaceutical industry (e.g. topic 44 in UK). Consequently, what is at stake in the public discussion in these two countries tends to be the issue of rendering the national healthcare system more sustainable and compatible with non-expansionary monetary policies, as well as austerity approaches in managing state government budgets. It is not by chance, therefore, that UK and Italian newspapers assign considerable amounts of space to this topic. At the same time, especially in UK (see topic 10) NGOs appear as strategic partners in the mainstream approach to biomedicine, working with state and regional governments under conditions of “subsidiarity”.

In conclusion, this comparative research – both longitudinal and synchronic, i.e. confronting different contexts – shows that biomedicalization processes appear to resonate in the media, demonstrating that a media analysis can be useful for analysing general trends and detecting changes in the social transformation of defining, managing and debating health and medicine.

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