Preface

The divide between science and policy, particularly when legislators overlook breakthrough scientific discoveries, is a longstanding phenomenon. Due to the complexities involved in tracing their co-evolution, it remains unclear what the precise relationship is between scientific advancements and public policies, how and when they interact. Questions still remain regarding whether this gap persists, what actions have been taken to close it, and to what extent progress has been made.

This paper is organized into two major sections. The first section addresses the management of the COVID-19 pandemic in three countries: Romania, Italy, and Sweden. These countries offer unique approaches to pandemic management while simultaneously sharing similarities in the types of public policies they implemented. The second section examines the dialogue—or lack thereof—between authorities and scientists in making the most informed decisions regarding a public health crisis. Methodologically, these two sections are underpinned by a social network analysis approach, complemented by the application of statistical models aimed at understanding how various public policies were enacted to mitigate the spread of COVID-19.

The first chapter provides a theoretical introduction to the field of public policy, emphasizing the identity of relevant actors (e.g., policymakers, decision-makers, and authorities in general), as well as the processes through which public policies are implemented (e.g., the stages that a public policy must pass through to be both implemented and sustainable). This chapter also discusses the structure of science and knowledge, focusing on the relational nature of science, particularly in the context of scientific collaboration and its main outcomes. The chapter also explores the evolving role that scientists have played in shaping public policies, highlighting that the creation of relevant policies involves a relational arrangement where multiple actors (e.g., scientists, authorities) collaborate.

The second chapter describes the methodology used in the paper. The approach taken is multi-dimensional and mixed method, combining both qualitative and quantitative techniques. Specifically, I use content analysis to describe the scientific productivity related to the COVID-19 pandemic in Romania, Italy, and Sweden. This is followed by secondary data analysis based on the stringency index, with the subsequent statistical modeling of public

policies being carried out through survival analysis, considering the dynamic and longitudinal nature of these policies.

The third chapter is dedicated to interpreting the results within the context of the research limitations, future study directions, and the originality of the research endeavor. Accordingly, this paper seeks to answer the question: *To what extent has science been considered by governments and public health officials in implementing the most effective measures to stop the spread of COVID-19*? The findings highlight a concerning lack of evidence-based management, which is even more alarming given that researchers anticipate future pandemics. This underscores the critical need to demonstrate that lessons have been learned after the COVID-19 pandemic.

Introduction

Since the beginning of the first reported case of COVID-19 in Wuhan, China, the collective experience of the pandemic has raised multiple opportunities to question the relationship between science, policy, and civil society. The incidence of Severe Acute Respiratory Syndrome coronavirus 2 (SARS-COV-2, responsible for COVID-19 infections) grew dramatically in China during the first months of 2020. By late February 2020, the virus spread to more than 114 countries worldwide. On 11 March, the General Director of the World Health Organization (WHO) assessed that COVID-19 can be characterized as a pandemic (WHO, 2020). It is thought that the outbreak originated from the Hunan seafood market in Wuhan, China. Subsequent investigations revealed that several patients had no history of visiting this market, despite the possibility that the COVID-19 patients in China may have consumed infected animals as food or visited the market. Therefore, it was recognized that this virus might be transmitted from person to person by coughing, sneezing, and the release of respiratory droplets or aerosols (Lotfi et al., 2020). Multiple papers emerged while analyzing human-to-human transmission (Hâncean et al., 2021; Li et al., 2020; Sirkeci & Yüceşahin, 2020; Zhang et al., 2022).

To minimize the spread of the virus, different actors advised citizens on how to behave, starting with hospital managers, doctors, or health policy experts. Statements from the public health ministries were the leading content on the news, different medical actors were invited in prime-time news, and the activities of the most important public institutions, such as the World Health Organization and United Nations agencies, were updated daily. The scientific community also quickly responded and tried to investigate the nature of the virus and explore strategies for addressing it. More than 1,470,058 articles and 131,361 preprints about COVID-19 have been produced since 2022, and the majority of them are published in an Open Access regime (Dimensions, 2023) in order to facilitate the access of policy actors and experts to scientific articles. From an epistemic point of view, the preprints should be consulted after their publication in scientific journals (a limit to how science acts when events require rapid interventions). This fact may be considered as opposed to the perspective of Van Dooren & Noordegraaf (2020), who argued that, unfortunately, science usually is "slow, contentious, collective, and sensitive to complexity" and in crisis time it should be "fast, univocal, personalized and direct". In other words, the large number of

scientific articles published in an Open Access Regime and their availability may greatly support policymakers.

The relationship between science and policy formulation should be based on evidence-informed decision-making (EIDM), which refers to the "*development, implementation, and evaluation of effective pro- grams and policies in public health through the application of principles of scientific reasoning including systematic uses of data and information systems and appropriate use of program planning models"* (Brownson et al., 1999). EIDM involves the most relevant, high-quality qualitative and quantitative evidence available from various disciplines and sectors relevant to public health (The National Collaborating Centre for Methods and Tools, 2021). Thus, EIDM helps to weigh options and choose the most suitable solution with effects on policies, social practices, and communities. Multiple actors can create public policies whose interaction can be represented under a social network form. Social networks are responsible for developing policies, as policy actors need to collaborate with scientific researchers to implement EIDM.

The COVID-19 pandemic has raised various tensions between scientists and policymakers. In order to address the nature of these tensions, I focused on how government departments and policymakers used science to provide efficient measures for halting the virus's spread. On the one hand, understanding the relations between the two communities is critical in order to choose the best solution and implement the most effective measures in fighting COVID-19. On the other hand, the diagnosis helped to understand if there is a cultural establishment of using science in adopting public policy and what should be learned concerning future social emergencies. Currently, the information between science and public policy remains unclear (Yin et al., 2021).

This thesis primarily focused on examining whether the public policies implemented during the pandemic were guided by scientific knowledge. The second objective was to better understand the dynamics between policymakers and scientists while facing an unprecedented public health crisis. I tried to contribute to understanding the connections between academic expertise and public policies in three European countries: Sweden, Italy, and Romania. The international perspective was provided in an effort to shed light upon the key similarities and differences that could enrich the understanding of the policymaking dynamic during times of crisis. Another objective was understanding the rationale behind the pandemic's management and evaluating how public policies have adhered to an evidence-based approach.

The research context

The available evidence about the relationship between science and policymakers and between researchers and policymakers is still unclear and lacks empirical evidence. There is considerable evidence suggesting a “large gap" between the two communities (Caplan et al., 1975). Many authors showed that those communities are from a parallel universe, as researchers are from Mars and policymakers are from Venus (Gaudreau & Saner, 2014). While multiple studies showed that policymakers are characterizing scientists as being very slow (Briggs, 2006), other studies showed a need for a bridge to connect (Zhao et al., 2020).

We have been facing an unprecedented, unstable, and very fluid policy environment due to the COVID-19 pandemic. At the same time, this was an excellent opportunity to measure the impact of science in the public policy-making processes, thus, in a very dynamic social context. The interaction between researchers and public policymakers in the context of COVID-19 is not widely understood, with limited scholarly literature available on the topic. Yin et al. (2021) wanted to check if the World Health Organization (WHO) policy documents and different governments are evidence-based. Overall, their study revealed some good news, showing a significant alignment between policy decisions and the scientific understanding of COVID-19. Related to who the entities that use science are, the authors showed that WHO produced many documents grounded in science. The governments' documents, even though they exceeded the number of articles written by WHO or other intergovernmental organizations (IGOs), are less likely to cite scientific studies.

Analyzing the whole coverage of an Italian quality newspaper, Crabu et al. (2021) found that the health emergency has been addressed primarily on political terms, with overwhelming scientific evidence. The results showed that the political perspective about the virus functioned as a moral and regulatory authority, as science was left behind. Science became a subsidiary domain used to legitimize the government’s actions while scientists were “neutralized” by the political discourse.

Without an empirical approach, Williams et al. (2020) highlighted the idea of trust and the importance of a credible, trustworthy, and independent “knowledge broker” that can provide policymakers with the evidence they need in order to make the best decision. Furthermore, the importance of efficient and

effective communication with different stakeholders is also a key point in the whole process. Cairney (2021) referred to the United Kingdom case in a more theory-informed approach, where evidence was part of a political process where different interests, power-holders, and individual strategies mattered more than science. It has been a game between policymakers and scientists, and in many cases, the latter only remained to give credibility and support to the voice given by every minister.

This dynamic between scientists and policymakers and the endorsement process must be diligently addressed first of all because of the lack of empirical evidence and, secondly, because many aspects remain unclear, and the majority of the results are opposite. Learning the rules that govern the relationship between scientists and policymakers will help to understand how they can collaborate in order to generate evidence-informed policy solutions.

This thesis is structured in the following manner. Initially, I introduce the concept of public policy from a theoretical-driven perspective. I informed the reader about the multiple definitions related to the concept and the fact that there has been no common definition of it. I focused on why a public policy must be considered a "living organism". After the introduction aspects, I focused on actors and the networks in which they are embedded. I also focused on policy networks and their different roles while discussing the cleavage between the two communities: scientists and policymakers. The second part of the thesis details the methodology used, including the rationale behind selecting Italy, Sweden, and Romania as case studies. This section includes information about the dataset and the data sources. The overarching framework of the thesis is based on a social network approach, concentrating on the interplay between social networks and policy networks. The third part illustrates all the results, while the last part focuses on the present study's role in advancing science, its limits, and possible further directions of investigation.

I explored the conceptual framework and numerous definitions of public policy in the next chapter. I also examined, according to the scientific literature, how public policy should be implemented. Public policies are rather the result of several factors, including their political understandings, their innate processes, and their negotiated nature. Although it seems to be a relatively static concept, their creation is dynamically altered by the underlying connections that lie behind its formulations.

Public policies. A theoretical approach

The concept of public policy does not have a unanimously accepted definition. Even though multiple examples of public policies come into mind, defining its internal components remains unclear. Cunningham (2015) argued that *Policy* is somewhat like "*the elephant – you recognize it when you see it but cannot easily define it*". Easton (1957) defined public policies as "*the authoritative allocation of values for the whole society, and it consists of a web of decisions and actions that allocate values".* Dye (2013) highlighted that only the government could "authoritatively" act on the "whole" society, and everything the government chooses to do or not to do results in the "allocation of values". Dye concluded that public policies represent "*whatever governments choose to do or not to do"*, focusing on the actions and critical role of governments. In this case, there is an equivalent status between the capacity of governments to take action and their lack of action. Following the same rationale, Kraft & Furlong (2018) stated that "*public policy is what public officials within the government, and by extension, the citizens they represent, choose to do or not to do about public problems"*. For Heclo (1972), a policy can be usefully considered a course of action or inaction rather than specific decisions or actions. Jenkins (1978) considered policy as "a *set of interrelated decisions concerning the selection of goals and the means of achieving them within a specified situation"*. Dye (2013) also stated that every other definition meant to elaborate on the understanding of the concept of public policies seems to "*boil down to the same thing".*

Considering the many interpretations of the public policy term, what is clear is that public policy represents **a course of actions** undertaken by governments aimed at addressing a public issue. Easton (1957) argued that legitimate authorities are the ones responsible for the formulation of public policy, referring to "*elders, paramount chiefs, executives, legislators, judges, administrators, councilors, monarchs, and the like, who engage in the daily affair of a political system*". Hill (2005) emphasized the multi-layered structure of the actors involved in the course of a public policy. This includes politicians, pressure groups, civil servants, professionals employed in the public sector, and, at times, individuals who perceive themselves as passive recipients of policy decisions. Moreover, public policy involves not only a course of action but **also "*a web of decisions*"** (Easton, 1957). Miroiu (2001) argues that public policy is a "***network***