



UNIVERSITÀ  
DEGLI STUDI  
DI PADOVA

## Università degli Studi di Padova

Dipartimento di Studi Linguistici e Letterari

Corso di Laurea Magistrale in  
Lingue Moderne per la Comunicazione e la Cooperazione Internazionale  
Classe LM-38

Tesi di Laurea

*Theoretical and practical analysis of the  
conceptual spheres of medical terminology  
with focus on COVID-19 terminology.*

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Anno Accademico 2020 / 2021



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### ***Abstract (IT)***

*Questo lavoro intende esplorare le caratteristiche del linguaggio specifico medico e della terminologia ad esso connessa. Partendo dalla definizione di lingua comune e linguaggio speciale si intende delineare le caratteristiche di questo ultimo. Successivamente si esplora il linguaggio medico nella sua complessità soffermandosi sulla terminologia ad esso connessa. Dopo un breve excursus sul ruolo dei corpora che saranno fondamentali per il percorso di ricerca si presenta il database terminologico multilingue TriMED. Infine, il lavoro si completa con una ricerca terminologica riguardante la terminologia relativa al COVID-19, si creano due corpora paralleli (uno specialistico ed uno non specialistico) e si procede all'estrazione terminologica. Con la compilazione delle schede terminologiche e la spiegazione dei risultati ottenuti da tale ricerca si conclude il lavoro terminologico. Lo scopo di questa tesi è quello di analizzare la terminologia medica prendendo in esame le sfere concettuali ad essa connesse e analizzarle su un topic medico che è diventato di dominio comune quale quello del COVID-19 a causa della pandemia attuale.*

### ***Abstract (EN)***

*This paper intends to explore the characteristics of specific medical language and its related terminology. Starting from the definition of common language and special language, the characteristics of the latter are outlined. Subsequently, is explored medical language in its complexity focusing the attention on the role of medical terminology. After explaining the characteristics of medical language, the paper will focus the attention on the role of medical terminology in the medical field. After a brief excursus on the role of corpora, which will be fundamental for the research path, the multilingual terminology database TriMED is presented. Finally, the work is completed with a terminology research concerning the terminology related to COVID-19, two parallel corpora are created (a specialist one and a non-specialist one) and the terminology extraction is carried out. Finally, the terminology work is concluded by compiling the term sheets and explaining the results of this research. The aim of this thesis is to analyse medical terminology by examining the conceptual spheres related to it and to analyse them on a medical topic that has become common knowledge, such as COVID-19, due to the current pandemic.*





## Riassunto

Lo scopo del seguente elaborato è quello di dimostrare l'importanza dei campi semantici in terminologia medica con focus sul database terminologico TriMED. Inoltre, l'analisi è stata ampliata a ricerca terminologica in ambito COVID-19. Ho ritenuto significativo portare avanti la ricerca terminologica seguendo due percorsi semantici: uno riferito ai campi semantici e uno al significato dei termini e alla comparazione multilingue dei termini stessi sempre su un livello semantico.

Il testo è strutturato in due parti principali una teorica e una pratica. La parte teorica ha lo scopo di mettere le basi per la comprensione del soggetto che poi si andrà ad analizzare. Il primo capitolo spiega cosa sia una "special language", le sue caratteristiche e i livelli di analisi coinvolti, orizzontale e verticale. È importante questa distinzione preliminare tra linguaggio comune e "special language" ovvero lingua specialistico poiché il linguaggio che si andrà ad analizzare rientra in questa seconda categoria. Nel secondo capitolo, infatti, si andrà a spiegare il linguaggio medico come linguaggio specialistico. Partendo dalla sua storia fino ad arrivare alla formazione delle parole e lo stile si esplicherà tutte le caratteristiche del linguaggio medico. Si designeranno dunque, le problematiche che un linguaggio specialistico quale quello medico comporta nella traduzione, in particolare nella terminologia. Così facendo si aprirà un successivo capitolo sulla terminologia e dopo un excursus storico e delle scuole terminologiche che si crearono si delineano le caratteristiche fino ad arrivare alle evoluzioni ed alle nuove metodologie applicate ad essa. Infine, si delineano le caratteristiche che la differenziano dalla lessicologia e dalla lessicografia e si delinea l'importanza della figura del terminologo. Il quarto capitolo affronta la tematica del corpus in quanto strumento fondamentale per la ricerca terminologica. Sia la terminologia che i corpora hanno subito degli implementi grazie all'utilizzo delle nuove tecnologie e l'avvento del computer ha aiutato il processo di stoccaggio delle informazioni in database terminologici e in corpora online. Il capitolo si conclude con le applicazioni queste terminologie computazionali al campo medico. È bene ricordare l'importanza di corpora di consultazione medica e database terminologici medici multilingue quali ad esempio TriMED. Il capitolo successivo analizzerà le caratteristiche di questo database terminologico inerente al linguaggio medico. Esso analizza termini in tre lingue: inglese, francese ed italiano. Tale database permette una consultazione rapida

ed è indirizzato a medici, pazienti e traduttori. Dopo aver spiegato le varie componenti della scheda terminologica su cui si basa TriMED il capitolo termina con una breve spiegazione della realizzazione della ricerca terminologica e della collezione dei termini ed infine dell'approccio di tale ricerca.

Il sesto capitolo conclude la sezione di teoria, analizza la distinzione tra campo lessicale e concettuale delineando di quest'ultimo le caratteristiche. A questo punto si procede con l'analisi delle sfere concettuali presenti nel database terminologico multilingue TriMED analizzando e spiegandoli tutti.

Il settimo capitolo presenta la parte pratica di tale elaborato e consiste in una ricerca terminologica. Il topic scelto è il linguaggio medico in particolare quello relativo al COVID-19. Lo scoppio della pandemia attuale ha messo in evidenza quanto una comunicazione efficace e comprensibile sia importante e quanto il linguaggio medico sia diventato di uso comune e per questo debba essere comprensibile a molti. La ricerca si suddivide in due fasi: fase preparatoria e fase esecutiva. La prima corrisponde alla ricerca di termini tramite una creazione di due corpora paralleli. Questi sono creati partendo da articoli selezionati da database scientifici e da media, si tratta quindi di articoli specialistici e no. Questo fattore è fondamentale per estrarre i termini e confrontarli ed ottenere una serie di termini che risultano presenti in entrambi i campi. A questo punto si procede con la creazione di schede terminologiche relative ai termini. Le due fasi conducono quindi a delle analisi che sono racchiuse in questo elaborato in due parti; una prima analisi riguarda il confronto tra termini e un'analisi a livello di significato. L'altra analisi fa riferimento alle sfere terminologiche e cerca di riportare i termini e i neologismi creati dalla pandemia nelle sfere concettuali sopra menzionate nel capitolo sei. Tale ricerca dimostra l'importanza della delimitazione delle sfere concettuali e l'importanza dell'analisi terminologica nel campo medico. Indubbiamente la pandemia causata dal COVID-19 sta già portando e continuerà a portare contributi scientifici in campo medico sempre innovativi. Nuove ricerche verranno condotte e sarà importante avere una terminologia medica, precisa, affidabile e database aggiornati per una comunicazione trasparente e precisa.

## **1.Introduction**

The purpose of this paper is to demonstrate the importance of semantic spheres in medical terminology with a focus on the TriMED terminology database. Additionally, the analysis has been expanded to COVID-19 terminology research. I considered it significant to carry on terminological research following two semantic paths: one referred to semantic fields and one to the meaning of the terms and the multilingual comparison between terms, always on a semantic level.

The text is structured into two main parts, one theoretical and one practical. The theoretical part aims to lay the foundations for understanding the subject which will then be analysed. The first chapter explains what a “special language” is, its characteristics and the levels of analysis involved, horizontal and vertical. This preliminary distinction between common language and “special language” or specialized language is important since the language that will be analysed falls into this second category. In the second chapter, in fact, it will be explained the medical language as a special language. Starting from its history up to the formation of words and style, all the characteristics of medical language will be expressed. Also, the problems that a specialized language such as medical language entails in translation, in terminology, will be identified. By doing so, a subsequent chapter will be opened on terminology and after a historical excursus and the terminological schools that were created, the characteristics are outlined up to the evolutions and new methodologies applied to it. Finally, the characteristics that differentiate it from lexicology and lexicography are outlined and the importance of the figure of the terminologist is highlighted. The fourth chapter deals with the theme of the corpus as a fundamental tool for terminological research. Both terminology and corpora have undergone implementations thanks to the use of new technologies and the advent of the computer has helped the process of storing information in terminological databases and online corpora. The chapter concludes with the applications of these computational terminologies to the medical field. It is worth remembering the importance of medical consultation corpora and multilingual medical terminology databases such as TriMED. The next chapter will analyse the features of this medical language terminology database. It analyses terms in three languages: English, French and Italian. This database allows quick consultation and is aimed at doctors, patients, and translators. After having explained the

various components of the terminology sheet on which TriMED is based, the chapter ends with a brief explanation of the implementation of the terminology search and of the collection of terms and finally of the approach of this search. The sixth chapter concludes the theory section, analyses the distinction between the lexical and conceptual fields, outlining the characteristics of the latter. At this point we proceed with the analysis of the conceptual spheres present in the TriMED multilingual terminology database, analysing and explaining them all.

The seventh chapter presents the practical part of this paper and consists of a terminological search. The topic chosen is the medical language that relates to COVID-19. The outbreak of the current pandemic has highlighted how effective and understandable communication is important and how medical language has become commonplace and therefore must be understandable to many. The research is divided into two phases: the preparatory phase and the executive phase. The first corresponds to the search for terms through the creation of two parallel corpora. These are created starting from articles selected from scientific databases and the media, therefore they are specialized and non-specialist articles. This factor is fundamental to extract the terms and compare them and obtain a series of terms that are present in both fields. At this point we proceed with the creation of terminology cards relating to the terms. The two phases therefore lead to analyses which are contained in this paper in two parts; a first analysis concerns the comparison between terms and an analysis at the level of meaning. The other analysis refers to the terminological spheres and tries to bring the terms and neologisms created by the pandemic into the conceptual spheres mentioned above in chapter six. This research demonstrates the importance of delimiting conceptual spheres and the importance of terminological analysis in the medical field. Undoubtedly, the pandemic caused by COVID-19 is already bringing and will continue to bring innovative scientific contributions in the medical field. New research will be conducted, and it will be important to have accurate, reliable medical terminology and updated databases for transparent and accurate communication.

## **2. Special language and common language**

### **2.1 Introduction**

A language can contain different subvarieties that therefore are called with the term proposed by Professor Michele Cortelazzo (1994: 8) *special language*, defined as a functional variety of a natural language which depends on a specialised field of knowledge or sphere of activity. It is used by a more restricted group of speakers the special language is a variety, in order to satisfy the communicative needs (first and foremost the referential ones) of that specialised field; the special language is constituted at the lexical level by a series of additional correspondences with respect to the general and common ones of the language and at the morphosyntactic level by a set of selections, recurring with regularity, within the inventory of forms available in the language. It meets the needs of optimal understanding at a specialist level and provides guarantees of precision, uniqueness, and conciseness. Special languages can be further distinguished into technical-scientific languages and sectoral languages.

### **2.2 Special language names and definitions**

A special language is the set of linguistic means (lexical, morphological, phraseological, and syntactic type) adopted in a conventional and consensual way by a set of individuals operating in the same sector, for the exchange and dissemination of information and knowledge related to it. A language can contain different subvarieties that therefore are called with the term proposed by Professor Michele Cortelazzo (1994: 8) *special language*, defined as a functional variety of a natural language which depends on a specialised field of knowledge or sphere of activity. It is used by a more restricted group of speakers the special language is a variety, in order to satisfy the communicative needs (first and foremost the referential ones) of that specialised field; the special language is constituted at the lexical level by a series of additional correspondences with respect to the general and common ones of the language and at the morphosyntactic level by a set of selections, recurring with regularity, within the inventory of forms available in the language. It meets the needs of optimal understanding at a specialist

level and provides guarantees of precision, uniqueness, and conciseness. Special languages can be further distinguished into technical-scientific languages and sectoral languages. Special languages are therefore professional jargons, the languages of the various academic, scientific, and technical disciplines, and all the languages of the community that share some knowledge or some specific activity. Some of these are very consolidated, such as the languages of the natural sciences, while others are rapidly transformed, for example the languages of various technologies.

Special languages are characterized by the presence of specific terminologies, but also by the use of so-called *collateral technicalities*, i.e., terms typical of a certain sector or stereotypical expressions not linked to communication needs (the drug that *antagonizes* instead of *counter*; *enforcement* texts instead of *interrogation*), of certain phraseological forms, syntactic peculiarities and the preference for certain grammatical forms (eg nominal style). Sobrero (1993) also uses the denomination *special languages* to refer to those languages used to communicate certain topics, related to work and professional activities, such as mathematics, biology, medicine, linguistics, music, sport...

On the use of the denomination of *special languages* or *sectoral languages*, some scholars such as Altieri Biagi (1978) cited in Serianni and Trifone, (1994) separate a special language such as the scientific one from the sectoral languages due to its characteristics of actively interacting strength with the common language and with the literary. Gotti (1991: 8) uses a different name to refer to these languages used by specialists in some professional field. In fact, to define a *special language*, Gotti believes that three elements must be present: the type of user, the specific reality to which the user refers, and the specialized use of language.

The 2005 ISO standard uses the name *special language* for those languages which belongs to a domain and are characterized using specific linguistic patterns<sup>1</sup> while Sager (1990: 105) speaks of *special languages* referring to<sup>1</sup> semi-autonomous, complex semiotic systems based on and derived from general language [and] their effective use is restricted to people who have received a special education and who use these languages for communication with their

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<sup>1</sup> Veronica Carioni, 2.1.1, Il dibattito sulle lingue speciali, Breve introduzione alla terminologia, [http://farum.it/intro\\_terminologia/ezine\\_articles.php?id=13](http://farum.it/intro_terminologia/ezine_articles.php?id=13)

professional peers and associates in the same or related field of knowledge and Sager-Picht-Draskau (1985) cited in Cabré (1992: 62) consider specialized languages as pragmatic subsets of the common language used for special purposes and in a legitimate context - that is to say, with the function of communicating information of a specialized nature at any level - at the highest level of complexity, between initiated experts, and, at lower levels of complexity, with the aim of informing or initiating other interested parties in the most economic, precise and unambiguous terms possible.

Kocourek (1982) quoted in Cabré, (1999: 61) also wrote about special languages intended as subcodes of the common language. *Special language* is a sublanguage of what is known as natural language; a sublanguage enriched with brachy graphical items, that, acronyms, and ideograms integrated into the language according to its grammatical constraints.

These studies testify the definition and usage of the term special language or sectoral language. Every language has different level of analysis therefore special languages presents horizontal and vertical analysis of the language.

### **2.3 Relations between special languages and common language**

The relationship between special languages and common language is characterized by continuous interchange and bidirectional contacts. Sager et al. (1980: 65) identify three different relationships established between the terms of the special language and the words of the common language (Sager et al., 1980: 242). In fact, there are:

- Specific terms referred to a specialist field used only by experts in that field.
- words of the common language used in special languages (in all or in one discipline) without variation of meaning.
- words of the common language used in specialized languages but with variation in meaning (minimum or total).

Among these, the last relation is undoubtedly the most widespread and is based on the semantic redetermination procedure. Furthermore, neoformations by derivation or by composition, acronyms and symbols or derivatives, sometimes adopted from foreign languages or classical languages (Sager et al., 1980: 65), can contribute to the formation of

specialized vocabulary such as in the case of medicine in which Greek and Latin contributes to the formation of a specialised terminology.

Sager et al. (1980: 244) argue that it is the lexicon that guarantees transparency and coherence to the specialized text through numerous means for the formation of words such as the adoption of loans from other languages or the ability to use one word category for another.

Another phenomenon that influences for example the English specialized lexicon is the so-called *backformation* (or *back-derivation*) which is related to word formation for verbal compounds and is described as the opposite of the affix since instead of adding elements which indicate a change of meaning or a word category, elements are subtracted to produce a different word.

## **2.4 The specialization process**

With the industrial revolutions in the seventeenth and eighteenth centuries, scientific and technological development required the introduction of special lexicons whose specialized meaning prevailed over the general meaning over time (Gotti, 1991). This process of specialization involved the creation of new lexemes of Latin or Greek origin from which, later, in combination with already existing lexemes, prefixes and suffixes were created which are still used today as *micro-* or *multi-*. The diachronic variation of terminology due to historical and temporal changes is one of the causes of the overlapping of terms we are witnessing today (Canepari, 2013; Altieri Biagi 1974, quoted in Gotti, 1991).

## **2.5 Level of analysis**

### **2.5.1 Horizontal**

On the analysis of a special language, two dimensions must be considered: horizontal and vertical. The horizontal dimension defines the variation of special languages in terms of content (for example, the language of physics is different from that of economics and that of law) and of sub-sectors (for example, to inside the language of medicine we find the language of pharmacology, the language of anatomy, etc.) (Cortelazzo, 1994: 3). In this regard, a distinction is made between



*physical sciences* or *natural* is *human Sciences* or *social* that De Mauro (1994a: 317) cited in Scarpa (2001: 5-6) calls respectively *hard* and *soft* depending on:

- the different nature of the phenomena studied: measurable and immutable objects in the physical sciences vs unpredictable and changing objects in the human sciences.
- empirical verification of the starting hypotheses: scientific verification for the physical sciences vs subjective verification for the human sciences;
- of the different degree of certainty of the results: absolute in the physical sciences vs vague in the human sciences<sup>2</sup>.

However, a special language is not a closed system, but sometimes it overlaps with the common language and depends on it on various degrees (Sager, Dungworth, McDonald, 1980: 65).

### 2.5.2 Vertical

The vertical dimension identifies the sociolinguistic variation of a special language, its degree of specialization and, consequently, its distance from the common language. Hence, we range from highly specialized languages to less specialized languages depending on the communicative situation and on the recipient, topic and purpose (Sobrero, 1993: 240). Indeed, it is important to remember that special languages are not limited to the communication between experts, but are also addressed to different recipients (Scarpa, 2001: 7). Based on the vertical dimension, special languages and their specialized texts can be divided into levels which Cortelazzo calls *sociolinguistic*. A first level includes communication between experts in written form whose distance from the common language is maximum and, therefore, the degree of formality is high, and the terminology is unique. Then there is a second level to which the communication between informal and direct, mainly oral, and a third level where communication takes place between experts and laymen in an informative form. According to Cortellazzo (1994:21) To use the special language experts keep distance from the common language to mark their belonging to a specialized category or to limit the understanding of their messages to their own category. In this

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<sup>2</sup> Veronica Carioni, 2.1.1, Il dibattito sulle lingue speciali, Breve introduzione alla terminologia, [http://farum.it/intro\\_terminologia/ezine\\_articles.php?id=13](http://farum.it/intro_terminologia/ezine_articles.php?id=13)

case it is possible to use the term jargon, defined as a distorted use of a special language that therefore has different traits from jargons (Cortelazzo, 1994: 22) and where the lack of transparency is deliberate and due not only to the will of the experts not to make people understand message to strangers, but also to problems relating to the understanding of concepts by non-specialists (Gotti, 1991: 9).

In conclusion, each level corresponds to a textual typology and a communicative situation, but it should be remembered that these divisions are entirely hypothetical since, they are not closed sets, the border between special languages and common language is blurred and it is not possible to systematize everything in univocal way.

## **2.6 Characteristics of special languages**

### 2.6.1 General characteristics

For a long time, the distinctive features of special languages have been terminology and lexicon as essential elements for the description and explanation of scientific and technical phenomena (Scarpa, in Magris et al., 2002: 28). Although morphosyntax and textual organization also play a key role in the characterization of a special language. According to Cortelazzo (1994:9) the lexicon provides distinctive elements that identify a special language as different to other special languages and to the common language. Studies of linguistics on utterance and the pragmatic-functional organization of the text focused the attention to a whole other series of criteria, as important as the lexicon.

For Sager-Dungworth-McDonald (1980) set the three basic criteria of special languages which are:

- economy: it is realized when the message is transmitted in a synthetic but effective way and, in the lexicon, this happens through the use of acronyms, derivatives and compounds, symbols and abbreviations (Sager, 1990: 108);

- accuracy: measures the accuracy with which the communication message is transmitted. This element conflicts with the previous one of economics since an articulated discourse better responds to the requirement of precision than a short and concise one.
- appropriateness: it is the trait that acts as an intermediary between economics and precision and measures the effectiveness of communication and the degree of specialization of a text.

These three factors are interdependent as each must compensate for the other two to obtain maximum communicational effectiveness.

The lexicon of special languages differs from the lexicon of the common language because the first one must be able to identify the sector of activity to which it refers, going beyond common experience or digging into the common language to analyse a more specific section of reality (Cortelazzo, 1994: 9). Sometimes, the lexicon of a special language is broader than that of the common language, and beyond the differences between special languages and common languages, the lexicon also makes a distinction between the same special languages. Terms allow special languages to differentiate themselves from the common language, sometimes excluding phenomena, such as synonymy or polysemy<sup>3</sup>, typical of the common language. However, it has been noted that this last aspect does not determine the status of a special language or not. In fact, even if in legal or medical languages these elements are present and the languages do not fall into the common language, it should be noted that, in practice, there is not always univocity (Cortelazzo, 1994: 12).

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<sup>3</sup> See M. Prandi, Natural lexicon and specialty lexicons, in *Color terminology*, edited by Franco Bertaccini, Sara Castagnoli, Francesca La Forgia, Bologna: Bononia university press, 2010.



### **3. Medical language as a specialised language**

#### **3.1 Introduction**

This chapter has the aim to illustrate the medical language as a specialised language. Medicine is a discipline deeply rooted in history. Its diachronic character is materialized both in the evolution of its knowledge and its names as well as in a fixed terminology which ensures the durability of the concepts through time. Medicine is born in an environment which conditions it and which, in turn, is influenced by new discoveries. Medical terminology depends closely on the social environment in which it is born. It relates to modes of reasoning which induce technical developments rather than follow them. The current hyper specialization means that even the internist can be disarmed in front of a patient who speaks to him about a result or quotes him a proper name which he has never heard of. Being a specialist also means ignoring entire areas of medical knowledge. This is where the difficulty lies in writing dictionaries and terminological databases which harmoniously combine updating the field and a broad epistemological vision.

#### **3.2 History**

Medicine is a discipline deeply rooted in history. Its diachronic character is materialized both in the evolution of its knowledge and its names as well as in a fixed terminology which ensures the durability of the concepts through time. Medicine is born in an environment which conditions it and which, in turn, is influenced by new discoveries. The transition between a ritual medicine, intended to reflect the design of the gods and therefore external to any objective will, and a medicine where the therapist seeks the understanding of pathological phenomena to become the actor of healing, or at least of remission, lays the foundations for a true medical science. This change of perspective reflects a profound change in mentalities too.

Due to a development in science and to the proliferation of concepts, the multiplication of names and the growing complexity of knowledge; terminologists had to subdivide domains into sub-domains in a first, then in microdomains. A logical development considering the growing hyper specialization, especially in medicine. Indeed, in the training received or in the exercise of his

profession, the medical translator is aware at first glance to the particular terminology of the medical discourse. The translation would therefore be both complex and easy. Complex, insofar as medical practice, subject to many years of university studies, cannot be dominated by a specialist in the human sciences, *a fortiori* when we know that medicine is crumbling more and more into independent disciplines which testify to the growing wealth and specialization of the field. Easy, because the translator's work would be summed up in the search for unambiguous, denoted terms, the meaning of which would be unsurprising since polysemy and ambiguity would be removed.

A text of the XX century by Henri Mondor, a surgeon of the abdomen, illustrates the interference of connotation in a semiological description:

*An excruciating and sharp pain diffused with trail to the left [...]. Little vomiting [...], foul, choleliform diarrhea. A low temperature: 38 ° [...]. But a pulse at 140, weak, fleeting. The face is leaden, drawn, gray, dazed, anxious...*

The text, however taken from a specialized medical book, acquires an almost literary clarification can in my opinion be noticed from the second half of the 19th century. ° century, which saw the triumph of observational medicine, known as clinical, where the patient, finds himself at the centre of attention, thanks to the combined auscultation, palpation, and percussion techniques. The use of hearing, the rehabilitation of the gaze and the manipulation of the limbs gave pride of place to a common vocabulary to describe this gesture.

By neglecting the diachronic dimension of medical science, many terminologists have preferred linguistics in their analysis of fields of specialization to the detriment of the discursive. In the XX century medicine became aware that it is also a science of *logos*. In this connection, the growing success of psychiatry, which was until recently the most neglected and criticized branch of medicine, has played a crucial role. However, psychiatry had already proposed a new synthetic vision of the sick man a century ago. This had initially failed, because the scientific community denied the patient an active part in the semiological description. At the same time, contemporary, hyperspecialized medicine, dedicated to breaking down the exploration of the human body into a multitude of subdomains. Organic or physiological fragmentation helped the depersonalization of

the doctor-patient relationship to merge into a specialist-organ relationship. The conjunction of depersonalization and hyper specialization led outside observers, including linguists, to think that medical discourse could only be impersonal, denying the individual any autonomous, psychological existence, outside a hierarchical scheme. deliberately reductive. The fragmentation of medicine into autonomous specialties thereby broke down the patient into independent organic entities and denied a systemic approach. Nowadays, despite the arrival on the front of the scene of immunology, which restores communication between the fields of specialism by a horizontal, decompartmentalizing vision, the fundamental principle of contemporary medicine remains that the body and its functions are expressed in physico-chemical and physiological terms and that the ideal, for a doctor, should be to become a chemical engineer, physicist, even electronics engineer of this powerhouse that is the human body. The complexity of medical techniques, whether diagnostic or therapeutic, have greatly limited the doctor's contact with his patient. On a reflexive level, the dialectic between clinical medicine, which was all-powerful until the dawn of the Second World War, and laboratory medicine has shifted from an era when intuition and observation had the primacy, to an era in which the diagnostic power is such that the clinic is no more than the prelude to the biological. Thus, the desired distribution of specialties generates a lexical structure which materializes in the principles of inclusion and hierarchy so convenient from a methodological point of view. It is precisely this methodological approach, based on a classification in drawers, which has been favoured by the terminology to avoid polysemic communicating vessels. It is neither more nor less than to circumscribe the use of a term or a phrase to a particular domain from which it could not escape while keeping the same meaning. The meaning would therefore be equivalent to a meaning caught in the grip of a field of specialty with a singular monologue. By doing so, we eliminate the transverse, interdisciplinary approach, which precisely establishes the relationship between several symptoms or between a symptom, materialization of a pathology, and its ethology, which is often far removed from it, at least in appearance. Listening to the patient, his anamnesis, sometimes says more about the origin of the suffering than very technical examinations. The doctor must listen to the patient as he listens to his body. The symptom is often polysemous, its contextualization sheds light on its deeper meaning, physiological or psychological. The same is true of the medical text. So, what would seem to be the new language of medicine splits knowledge and the terminological reservoir to

reason in organic terms. Medicine, as a field of specialty or a constellation of sub-fields, is characterized by a systematic use of terms, denoted by essence, to the detriment of words, metaphors or metonymies which do not guarantee neither the exactness nor the rigor of the discipline.

Medical terminology depends closely on the social environment in which it is born. It relates to modes of reasoning which induce technical developments rather than follow them. The current hyper specialization means that even the internist can be disarmed in front of a patient who speaks to him about a result or quotes him a proper name which he has never heard of. Being a specialist also means ignoring entire areas of medical knowledge. This is where the difficulty lies in writing dictionaries and terminological databases which harmoniously combine updating the field and a broad epistemological vision. Under the influence of immunology and psychiatry, medicine reasoning more and more in a systemic way, considering the individual, not only physiological, but also psychological. New advances in molecular biology and the development of epidemiology have played their part in this approach.

Immunology, later, creates a theory of the language of organs, just as psychiatry attributes clinical symptomatology to the lack of expression and communication of its patients. In this way, many conditions no longer have pathogenesis, but psychogenesis<sup>4</sup> which testifies to the active etiological role of the individual in the onset of the disease. In addition, autoimmune diseases (psoriasis, multiple sclerosis, insulin-dependent diabetes, etc.) show the limits of *self* and the uncertainty of a clearly defined ontological identity. They also bring back the uncertainties about the causes of diseases and the organization of the immune system as a whole: pathologies are not always caused by infectious agents.

Consequently, the medical discourse as a whole - because immunology crosses horizontally the physiological structure - becomes metaphorical and conceals, behind an apparently impersonal style, a quite personal fight against the disease. We will therefore speak of a battery of tests, defense mechanisms, therapeutic arsenal, patient cohorts or antiviral strategy. These rounds of a military lexicon reconnect with the thinking subject who is mobilized (another military term) to fight against the antigen.

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<sup>4</sup> See Alexander F. (1925) « *La médecine psychosomatique* » ; Paris 1934



The crucial problem of medical terminology is not only given by the difficult, sometimes erratic relationship between concept and name. The link is not direct, immediate, transparent; it is winding and takes side roads. The vocabulary and modes of expression of medicine are *professionals*, i.e., they are not necessarily *scholars*. This also explains why this vocabulary is constantly being renewed or, better, that it is renewed by the scientific community over new discoveries. Equally interesting is the renewal of vocabulary. The *consumption* of the XIX<sup>e</sup> century has become the *tuberculosis*, the *anaphylaxis* became the *allergy*, which is why the confusion between the two entries is maintained. In the psychological field, the term *relaxation*, learned doublet of *relaxation* previously applied to the herniated abdominal wall. Today, the term is confined to its psychological use.

This new language of medicine imposes a new scientific vision of man in the first person, the inclusion of which in the translation is essential to represent the sociolect in the spotlight today in the medical community. The quest for issues buried under the linguistic surface shifts the translator's attention to the author of the text and to its recipient and gives it a dynamic status. Often, medical communication is more oriented in acquiring position in the scientific community than to the desire to advance in the discipline. Medical eponym is a striking illustration of this phenomenon: whether we think of Parkinson's disease, Hansen's bacillus, or Kaposi's sarcoma. Thanks to the informatic development of our century, medicine blogs are more accessible to people, and online encyclopaedia can help to find information and explanation to specific medical terms. In this context the terminologist and the translator in medical field invest an important role in the communication and in the translating of correct terms.

### **3.3 Characteristics of medical language**

Medical language has two characteristics that distinguish it from any other specialist language, namely the richness of terminology and the impact on the common language (cf. Serianni 2005: 115). As for the richness of terminology, proof can be obtained by consulting a dictionary, in which about one out of twenty entries are in the medical field. The strong impact on the common language is due, however, to the fact that the widespread interest in health problems has led to a great development in popular communication. According to the linguist Serianni, there are three main

reasons to explain the vastity of medical lexicon. The first is that, at least until XX century, medical terms were formed from ancient Greek compounds without resorting to the semantic expansion of terms already present in the common language. The second is based on the strong individualism that characterizes the medical profession. He aims to leave his own linguistic trace, as in the case of the naming of a new pathology. The third reason is represented by the complexity and variety of the object of study, such as anatomy and pathology (cf. Serianni 2005: 116).

Medical terms can be classified according to the following criteria (cf. Serianni 2005: 121):

- semantic criterion;
- formal criterion;
- sociolinguistic criterion

With the semantic criterion they are distinguished (Serianni 2005: 121),

- technicalities of anatomy (*ulna, masseter*);
- physiology (*metabolism, mydriasis*);
- of the pathology (*glaucoma, septicemia*);
- relating to instrumentation and analysis methods (*endoscope, radiology*);
- belonging to sciences closely connected with medicine (*narcissism, estrogen, etc...*)

The formal criterion takes the linguistic form as a reference, classifying the technicalities in (cf. Serianni 2005: 121):

- monorematism that cannot be analyzed: single words whose meaning it is not possible to intuitively trace, such as *thyme, epilepsy*;
- monorematic analysable: single words whose meaning recalls that of ancient Greek or Latin, such as terms with suffixes (*-ite*) or prefixes (*-ipo*);
- polirematic: multiple words that make up a single lexical unit such as *foot and mouth disease*.

The classification by sociolinguistic criterion leads to the conclusion that some terms have entered common speech and have assumed symbolic meanings. An example is the medical term *liver*, which in addition to being a technicality, is also a common word with an attached idiomatic phraseology (*have the guts*).

These types of technicalities are called specific technicalities, in fact:

to indicate the small bone that forms the terminal part of the vertebral column we must necessarily use technicality *coccyx* (without prejudice to the possibility of explaining us using a periphrasis or perhaps the hyperonym *bone*, accompanied by deictics [...]) (Serianni 2005: 127),

Parallel to specific technicalities, in medical language there are also collateral technicalities, that is:

words (nouns, adjectives, verbs and, to a lesser extent, constructs) equally characteristic of a certain sectoral area, which however are linked not to actual communication needs but to the opportunity to use a high register, distinct from common language [...] (Serianni 2005: 127),

These two sentences are considered as an example (Serianni 2005: 128):

- the patient *feels a strong ache to the pit of the stomach*;
- The patient *accuses (or complains, reports) severe pain in the epigastric region* (medical record written by the doctor).

The following chart show the words of the common language used by a patient to explain the symptoms to the doctor with the collateral technicalities used by the doctor in compiling the medical record:

<b>Patient Common words</b>	<b>Doctor Technical collocations</b>
feels	accusation
strong	severe
stomach pit	Epigastric Region,

It is evident that the collateral technicalities of the doctor modify the register but for communication purposes there are no relevant changes. Therefore, the collateral technicalities belong to the expository style of doctors, who can choose to resort to them or to remain in the register of the common language.

The collateral technicalities, unlike the specific ones, are not stable: in fact, they are linked to the needs of the stylistic register, therefore they have margins of oscillation (cf. Serianni 2005: 130). In addition, they are not limited to the lexicon but “also invest deeper structures” (Serianni 2005: 131), such as parts of speech and microsyntax. In the first case, “the [...] recourse to adjectives of relation is remarkable” (Serianni 2005: 131). Some examples are *nasal pits* is *eyeball*. From the examples it is understood that the general structure of this type of collateral technicality is generic name + adjective bearing the specific meaning. That is only one example, however. Serianni, in fact, has studied several texts and has drawn a rich case series, reported below (2005: 131):

- *event* + adj.: to indicate an unspecified episode of pathological significance, *thrombotic event*, *acute cardiovascular events*, etc...;
- *on site* + adj.: to indicate a certain location, *in the otological office*, *in the retrosternal area*, etc...;
- *on a + basis* adj.: to indicate a certain aetiology, the fact that is the basis of a diagnosis, the clinical premise of a certain process, *a psychosomatic pathology*; this collateral technicality concurs with *of* + adj., *coma of diabetic origin*, etc...;
- *of type* + adj.: to indicate the salient data of a pathology, framing it from the nosography point of view, *lumbar type thickening*, etc...;
- *risk* + adj.: to indicate the probable onset of a certain pathology, *subject to headache risk*, etc....

Micro syntax, on the other hand, provides medical language anonymous, as the indefinite article is omitted in objects, subjects and names of the predicate in the postverbal position in the singular. Seriani explains an example of this type of microsyntax in the phrase “food intolerance towards some foods has been demonstrated”. It is noted, in fact, that the term *intolerance* it is not preceded by the indefinite article. However, the article is not only omitted in the case described above but also in the indirect complements with a preposition. In this case we are dealing with the omission of definite articles which involves the use of simple prepositions instead of articulated ones. Another example is “passage of ascitic fluid into the pleurisy cavity” (Serianni 2005: 133). Again, the term *cavity* it is preceded by the simple preposition only *in*, which replaces the articulated

preposition *in*. Another case in which the article is not expressed is the following (Serianni 2005: 133),

with some names treated as proper names and precisely:

- a) Latin names of bacteria, viruses, and other microorganisms with their relative Italian derivatives (for example *streptomycin*, from the name of the genus *Streptomyces*);
- b) registered names of medicines (with some fluctuations).

These examples help clarify the concept (Serianni 2005: 134):

- a) “it is necessary to exclude a concomitant infection with *Treponema pallidum*”
- b) “Supradyn should be taken in a dose of one tablet [...] per day”

To conclude, the examination the last type of collateral technicalities: the lexical collateral technicalities. They are the most numerous and can be classified as follows (cf. Serianni 2005: 140):

- general nouns: terms of extreme semantic latitude, such as *damage*, *done*, *phenomenon*; ex. High doses can cause damage to the blood;
- synonyms of higher register than forms of the common language: eg. *debut* /Start, *inhibit* /to prevent, *previous* /previous one;
- semantic rejects: these are words that generally refer to human subjects but which in this case are used about inanimate entities, eg. *defect* / lack, deficiency; or they are words that change the connotation, from positive to negative, eg. *to appreciate* / find.

### **3.4 Influences from other languages**

Over the centuries, medical language has been influenced by several languages, which have left their mark on the lexicon of medicine. These languages are Greek, Latin, Arabic, French and English. Following a chronological path, Greek was the first language that contributed to the formation of the medical language. Evidence, albeit in small numbers, of Greek terms in medical Italian, has existed since the Middle Ages (Serianni, 2005). These are terms like *alopecia*, *enema*, present in documents of the fourteenth century. According to Serianni, in the early centuries the fundamental means for the entry of Greekisms into Italian was the vulgarization of Latin, even if it is true that in many cases the translator intervenes with periphrases or substitutions that do not

allow Greek take root. The linguist then provides some examples to support what has been said, such as *aneurysm, colon, peritoneum*. On the other hand, the modern formation of medical Graecisms dates to the eighteenth century (cf. Serianni, 2005).

After Greek, the ancient language that marked the medical lexicon is Latin, although the Romans did not produce medical texts but translated a great deal of them from Greek. In these translations Greek forms were morphologically adapted to Latin. Some examples are found in the terms *eye, heart, lung*. As for the pronunciation, or whether it is appropriate to follow the Greek or the Latin one, the following Serianni foresees the following cases (2005: 174):

- convergence between Latin and Greek accent, eg. *paralysis*, lat. *paràlysis*, gr. *parálysis*;
- cases of divergence in which the Latin accent prevailed, eg. *arthrosis*, lat. *arthròsis*, gr. *árrhrōsis*;
- cases of divergence in which the Greek accent prevailed, eg. *cholera*, lat. *chòlera*, gr. *choléra* and the whole series of suffixes in - *ia* , as *glycemia* , *cardiology* , etc... ;
- cases of divergence in which neither of the two accentuations clearly prevails, eg. many technicalities in *anastomosis* from lat. *anastomòsis* / *anastomosis* from gr. *anastómōsis*.

Until the humanistic age, the Arabic language also played a role in medical language. Arab doctors contributed to the renewal of medicine in the late Middle Ages (cf. Serianni 2005: 176) and the arabisms that have survived until today, although few, mostly belong to anatomy: this is the case of *nape*, or casts *pious mother, dura mater* and vein *saphenous*.

Regarding French, Serianni states that the French influence in the Italian medical language is of enormous proportions, but difficult to specify in the absence of studies. In fact, most medical Frenchisms fall into the category of xeno-Latinisms or xeno-Greekisms: technicalisms fashioned from Latin or Greek material that could have been spread by any other Romance language.

Words of French origin are *chin guard* (relative to the chin) from *menton*. It is worth mentioning the presence of non-adapted loans, among which the oldest and most known is *scalpel*.

The language that has exercised and still exerts a great influence on the Italian medical language is English. According to Serianni, five categories of Anglicisms can be distinguished, namely (2005: 186):

- generic or occasional, often possible even outside the medical language, and tend to be replaced with Italian terms: *screening* of the population, *investigation*, *exam*;
- related to the pathology, including some rooted in use for some time: *shock* haemorrhagic;
- related to surgery: *bypass*, *shunt* / fittings;
- related to diagnostics: *breath-test*, *follow up*;
- of biological field: theory of *undefilling*, poor filling.

### 3.5 Word formation

In medical language, composition and derivation are often used in word formation. In linguistics “composition is the combination of two free elements” (Serianni 2005: 195). This principle applied to the medical language results in the combination of two or more Latin or Greek terms. An example is the term *Gastroenterology*, consisting of the Greek words, *gaster* /stomach, *enteron* / intestine e *logos* /speech. The derivation, on the other hand, is “the combination of a free element, that is, it can also be used as an autonomous word and of an affix (prefix or suffix), that is, of an element that cannot be used alone”. In medical language the typical suffixes are *-Itis*, *-osis* *-Oma*, and refer to the pathology.

The suffix *-itis*, indicates an inflammatory process affecting the organ at the base; ex. *bronchitis*: inflammation of the bronchi. The suffix *-osis* indicates a non-inflammatory condition often degenerative. It is opposed to *-Itis*, with which it sometimes forms pairs like *arthritis* / *arthrosis*. Moreover *-osis* in many cases it performs the function of hyperonym to refer to a group of pathologies with a common characteristic. An example is *avitaminosis*, that is, a set of disorders characterized by the absence of vitamins.

Finally, *-Oma* is the suffix that indicates tumours: the base of the word, that is the root, can indicate the affected anatomical district. However, this suffix can also refer to other pathologies, such as in *granuloma* or *hematoma*, in which it means “lesion occupying space” (Serianni 2005).

A separate explanation deserves the suffix *-ism*, whose derivatives “can be traced back to three fundamental types” (Serianni 2005: 203). In the first type the base “can indicate the external element responsible for a certain pathology”, eg. *botulinum* / *botulism*, *alcohol* / *alcoholism*, etc.... In the second type, the base can indicate “the pathology itself, sometimes with a hyperonymic

value” eg. *adenoid / adenoidism, sleepwalker / sleepwalking*, etc.... The third typology uses the introduction of prefixes such as *hyper-* or *hypo-* in the base, eg. *hyperthyroidism, hypothyroidism*, etc....

Another typical feature of medical language is the suppletivism. In linguistics, supplementalism is a phenomenon whereby, within the same paradigm, the different forms derive from different roots (Beccaria 2004). Supplementalism has been encountered in the medical language since the time of Vesalius (16th century): the intervention of the well-known Flemish anatomist and doctor in the anatomical field, resulted in a significant presence of Latin terms in anatomy, while in the pathological lexicon language prevail Greek. A typical case of supplementalism is represented by the paradigm consisting of a nominal base (of popular drawing) and an adjective of learned relationship drawn from Latin or, more often from Greek. Examples are *eyelash / ciliary; liver / hepatic*, etc....

Eponyms and acronyms are also taken into consideration.

Eponyms are names of a disease, instrument or organ that refer to the name of the scientist who studied or discovered them. (cf. Serianni 2005: 211). For example, *Parkinson’s disease, Alzheimer’s disease, Capgras syndrome*, etc.... Some eponyms also derive from literature or mythology. It is the case of *Achille’s tendon, Pickwick syndrome* or *bovarism*.

These denominations have often been criticized because of the opacity caused by the proper name which prevents us from deducing their meaning in the absence of specific knowledge.

The acronym is formed by the initial letters of words, phrases, or definitions. concentration This use is frequent in reports, ie in “texts written by a doctor and ideally intended for other specialists” (Serianni 2005: 213). An example of an acronym is TAC, *computed axial tomography*, among other things also cast from the English CAT, *computerized axial tomography*. Given the derivation from English, “only a small part of the acronyms referring to medicine as a science and clinical practice reproduce the order of the words of Italian” (Serianni 2005: 214). Among the rare examples we have VES, *erythrocyte sedimentation rate* or ECG *electrocardiogram*, but in most cases the English order is preferred as in the case of AIDS, rather than SIDA (used instead in French).



### 3.6 Style

The style of the medical language reflects the characteristics of any other specialized language. While presenting some of its peculiarities. The use of the nominal style is frequent, and manifests itself in the following ways:

- nominal sentences, that is, without the presence of a verb of finite mode, eg. *rhythmic tachycardic cardiac action, not declining edema*;
- noun as a concentrate of informative charge, the verb is instead entrusted with the task of a simple syntactic vector, semantically generic, eg. *some gastrointestinal disorders have been reported*;
- reduction of verbal morphological parameters (manner, time, person) used and usable, eg. *superinfections from resistant bacteria may occur rarely*.

The use of passive is another typical stylistic aspect. Passive for Serianni responds to the pragmatic purpose of ensuring the theme-row progression, achieved by dislocations in the spoken language: *the safety of the drug in this area has not yet been established*; and it is a way to guarantee the cancellation of the agent, that is the typical depersonalization of the medical-scientific discourse. As for emotionality, medical texts lack emotions or subjective opinions, even if at least until the end of the nineteenth century doctors introduced their clinical opinion with expressions of circumstance, regretting the hassles of an illustrious patient. In modern medical language, what emerges, however, is the euphemistic veil that allows the doctor not to brutally present an unwelcome reality to the patient, without hiding it. Often the euphemistic veil is achieved with the use of acronyms such as HD for Hodgkin Disease.

Metaphors and similes are two other aspects of the medical language style. In times when there was no diagnostic imaging, the use of metaphor was the cheapest method to communicate new descriptive acquisitions, such as *snout of tench*. Even today, metaphors such as *heart to shoe*, lung lesions *ground glass*, which underlines how figurality is still used. Cures for diseases are also represented by metaphors, such as *fight* against cancer, to be *affected* from stroke, *eradicate* fever etc ....

The similarity, on the other hand, can be classified based on the person evoked, which may concern:

- a) the biological and medical field, familiar to the writer;
- b) the plant and animal world that falls into daily experience;
- c) heterogeneous images and objects of immediate evidence.

Ultimately it is necessary to mention the importance of colour names in medical language. There are a great variety of them, and they affect both anatomical and pathological fields. In the past, it was in the urinalysis that most of the colours were found, such as: *aqueous, greenish, orange, reddish, sooty, rusty, black*. Serianni has identified six groups of adjectives composed of colours, schematizing them as follows:

- simple adjectives (*red, green, yellow*) and altered (*reddish, greenish, yellowish*); sometimes accompanied by the suffix *-ish*;
- double adjectives formed by two different colours, eg. *albo-waxy, white, blue, etc...*;
- double adjectives formed by two colours in which the first indicates a colour, the second the light-dark or the bright-opaque, eg. *dusky white, deep red, dark red, etc...*;
- relationship adjectives taken from terms that indicate a referent typically with a certain colour eg. *aqueous, amarantaceous, milky, etc...*;
- relationship adjectives taken from terms of biological environment, eg. *hepatic* that stands for *dark yellow*;
- nouns indicating referents with a characteristic color, referred to as exemplary and universally known terms of reference, eg. *coffee amaranth, ash, etc....*

From what has been said so far, it is possible to affirm the relevance of lexical aspects in medical language, dominated by technicalities that are the constant of medical texts, both written and oral, and which vary in quantity and quality depending on the type of text. A terminological precision and attention to language are two fundamental bases of medical language that anyone who professionally manages (therefore also as a translator) must always have as a reference point.

### 3.7 Medical translation

In what contexts it is possible to find medical translation? Medical translation can be found in different contexts, from conferences (in this case the task of transposing the message between various languages is entrusted to the interpreters) to specialized texts. A specialised text is addressed to a professional audience of doctors or specialists.

These documents are medical and pharmaceutical research, clinical studies, protocols, regulatory documents, university reports and texts for future doctors. This text use is specific and contains technical terms because they are aimed at people who know the terminology of the sector.

A popular text is aimed at patient audience. The language is simple because these documents must be understood by an audience of non-professionals. An example of popular texts is the package of leaflets, the hospital sites, the informed consent, and the brochures we find in doctors' offices. All these texts are addressed to ordinary people, which would certainly better understand the term fever rather than pyrexia. Then there are all conferences, where interpreters intervene to facilitate communication in multiple languages between professionals in the sector.

Medical translation, like all types of highly technical and specialized translation presents a whole series of not indifferent difficulties:

- Tendency not to specify or imply
- Geographical differences
- Are different concepts
- Cultural and stylistic differences

In this field, especially when the texts are written by and for professionals, there is a tendency to imply or not to specify some things. For example, if I read marrow in an article I have to understand if it is bone marrow , spinal cord or medulla oblongata . Surely a doctor has understood this from the context, so the translator must also have one medical preparation, because the meaning of words often lies not in the individual words but in the context.

There are geographical differences in various countries of the world.

If we consider the English word *biweekly* (bi = two, weekly = weekly), it has a different meaning depending on the origin of the person who says it. A US doctor who prescribes a medication

*biweekly* he will give a therapy every two weeks, while a UK doctor will prescribe the same pill twice a week.

Medications also are different in other countries. Sometimes the same active ingredient has different names, sometimes the name is the same but the dosage changes. For example, aspirin in Italy it contains twice the active ingredient than in the United States. There are also many differences in type conceptual, for example in the organization of medical records or in the drug approval process. That is why a translator must know not only the specific terminology, but also all the language system behind it.

Their culture it greatly influences the use of words, the style and structure of the texts. In Italy, for example, we have a thorough general knowledge of medicine. Any Italian grandmother knows what the high blood sugar, while an English doctor will explain to his patients that they have high blood sugar (*high blood sugar* ).

As for it style, Italian medical texts, in particular medical researches, have a more literary style. Instead, clinical records often tend to use dry language, omitting articles and sometimes verbs. In English, on the other hand, short and simple sentences are used, the style adapts to the target audience.

## 4. Terminology

### 4.1 Introduction

The reality is made up of phenomena, facts, and events that we recognize, catalogue, and interpret through mental constructions. This knowledge is organized in networks of related concepts in temporal and causal structures. To communicate them to others, we use signs, especially the linguistic ones called terms.

The economic globalization the internet development allowed an increase in trade and competition with more products, shorter product production cycles, more laws, rules, and regulations and therefore more documents in less time, more translators and authors, more frequent updates, more languages. In fact, it has been calculated that the whole of human knowledge doubles approximately every five years and this period tends to get shorter and shorter. Every day, experts, technicians, scholars, scientists, and various authors around the world coined new specialized terms (often in English) to name abstract objects, products, facts and concepts. We all experience it daily. For example, browsing newspaper articles on the economy, health, climate and sport it is easy to come across terms such as: HIV, influenza A, Hfc, Cfc, spread, spending review, fiscal compact, veronica, sombrero, restart, pressing.

Terminology is an important tool to better understand specialised languages. It allows using modern technologies such for example online database or corpora, to research for a specialised term. At first, it is worth understanding what terminology is. According to UNI ISO 1087 (2005)<sup>5</sup>, the terminology is designed as a set of designation belonging to a special language where the term designation means the representation of a concept by means of a sign that denotes it. Sager (1990) defines the terminology as the study of and the field of activity concerned with the collection, description, processing and presentation of terms, ie lexical items belonging to specialized areas of usage of one or more languages.

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<sup>5</sup> See Veronica Carioni, 2.1.1, Il dibattito sulle lingue speciali, Breve introduzione alla terminologia, [http://farum.it/intro\\_terminologia/ezine\\_articles.php?id=13](http://farum.it/intro_terminologia/ezine_articles.php?id=13)

## 4.2 Lexicology vs terminology

Lexicology is the study of the lexicon, the set of words and phrases of a particular language or context, in all its forms. Study, record and describes words and terms, both general language and of the special languages.

Terminology, on the other hand, is the discipline that systematically studies the concepts and their denominations used in the specialized languages of a science, a technical sector, a professional activity, or a social group, with the aim of describe and / or prescribe correct use.

The functions of terminology as a discipline are therefore essentially three:

- systematic description of terms, that is, of words, phrases, expressions, and symbols used in well-defined sectors, in one or more languages
- dissemination of technical knowledge through structured terminological resources such as terminological sheets, glossaries, and databases
- definition of norms on the use of terms and elaboration of terminological standards or terminological sections relating to specific domains and approved by authoritative bodies on the subject.

The quality of a specialized translation, written or oral, largely depends on the degree of equivalence and adequacy of the terminology used. It is the case of bilingual terminology or multi-lingual terminology.

In fact, to achieve a quality translation, the translator must use a coherent lexicon that conforms to the one normally used in the sector of interest or by the client. Furthermore, in this way the translation itself can be considered a reference for subsequent works. An accurate terminological activity therefore not only ensures the quality of the translation, but significantly reduces its time. In fact, it decreases both the time to search for terms to be used and the quality of the translated text.

### 4.3 History

To be able to speak of terminology as a science, we must wait until 1900. Until then, scholars relied on nomenclature to classify names belonging to scientific disciplines such as botany, chemistry, and medicine. In 1600, driven by scientific needs, biologists like Linneau, naturalists like Montceau or chemists like de Morveau had to integrate the nomenclatures with short descriptions for each term in order to facilitate the spread of scientific knowledge and began to set a system of classification also on encyclopaedic knowledge. So did Lavoisier and Carlo Linneo who contributed to the definition of a new methodology.

The period in which the use of the denomination of terminology such as science of terms, corresponds to a historical moment of enormous changes: socio-economic evolution, growing nationalism and colonialism lead the stronger states to exercise a strong control over languages with the introduction of new linguistic and cultural policies and the abolition of some minority languages. The technical and scientific development of the nineteenth century inevitably contributed to the growth of terminology by creating an homogeneous vocabulary, considering the XX century a turning point for this discipline.

According to Auger cited in Cabré, 1999, modern terminology in the twentieth century went through four stages of development<sup>6</sup> :

- Its origins. From 1930 to 1960 the principles of modern terminology are identified and a new methodology which guarantees a systematic formation of the terms is defined (Cabré, 1999);
- Structuring. From '60 to '75, innovations in the field of information technology revolutionized terminology allowing the creation of the first terminological databases.
- Development. From the mid-1970s to the mid-1980s, terminology took part in linguistic modernization thanks also to innovations in computer science;
- Expansion. Since 1985, new technologies have contributed to the development of terminology which assumes an increasingly important role for the circulation of goods and services at an international level.

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<sup>6</sup> See Veronica Carioni, 2.1.1, Il dibattito sulle lingue speciali, Breve introduzione alla terminologia, [http://farum.it/intro\\_terminologia/ezine\\_articles.php?id=13](http://farum.it/intro_terminologia/ezine_articles.php?id=13)

The birth of modern terminology is attributed to Eugen Wüster and dates back to 1930, when an in-depth version of the Austrian engineer's thesis was published: *Internationale Sprachnormung in der Technik, besonders in der Elektrotechnik*. In this work, Wüster proposes a theory of terminology and a new methodology, as he believed the terminology was a tool that should be used as effectively as possible to eliminate ambiguity from scientific and technical communication.

According to what is considered today the traditional approach, terminology has an interdisciplinary character that combines logic, computer science, linguistics, and the sciences of things. Without prejudice to the primacy of the concept over the term and the relationships between concepts and terms, among the key points of the general theory of terminology, listed by Magris et al. (2002) are:

- the concepts must be studied within a conceptual system that can be modified and that identifies the relationships existing between the concepts;
- definitions of concepts can be intentional or extensional:
- the term must be associated with the concept based on its use within the language or by decision of experts in terminology commissions;
- for the principle of univocity, in a domain, the term refers to a single concept;
- for the principle of synchrony, terminology is synchronic in that it does not study evolution, but rather the conceptual system that is inherent in every special language.

#### **4.4 Terminology schools**

During the twentieth century, the terminology was the object of study in countries such as Austria, the Soviet Union and Czechoslovakia and, without any doubt, Wüster's work provided interesting insights for the development of this discipline.

Of the many centres of studies created in the world, four main schools with different approaches to terminology should be mentioned: the Vienna school, the Prague school, the Moscow school, and the Canadian and Québec school.



#### 4.4.1 Vienna school

Based on Wüster's general theory of terminology, the Vienna school is the oldest and is labelled as a classical or traditional school. According to Magris (2002), in this school the concept prevails over the term and only the uniqueness and standardization of terms and concepts can make specialist communication correct and effective.

#### 4.4.2 Prague school

For the Prague school, terms play a key role and research aims at the standardization and coding of terminologies by competent institutions or organizations.

#### 4.4.3 Moscow school

Founded in 1933 by Caplygin and Lotte who collaborated in the creation of the *Commission for Technical Terminology*, which later became the *Committee for Scientific and Technical Terminology of the USSR Academy of Sciences*, the Moscow school was started by engineers and researchers and deals with terminological standardization, conceptual systems, and creation of clear and precise terminologies. Lotte's research ranged from studies on methodologies for scientific and technical terminology, problems of accuracy and unambiguity of terms to studies on the selection and structure of technical-scientific terminology (Felber, 1984). In 1942, Terpigorev, director of the *Committee for Scientific and Technical Terminology*, realized that the most widespread shortcoming of terminology was the existence of terms having more than one meaning and it was important to start defining conceptual systems.

#### 4.4.4 Canadian and Québec school

The Canadian and Quebec school was founded in the seventies to solve problems related to bilingualism and continuously encourages research by combining terminology and computer science.

#### **4.5 Currents of terminology**

Depending on the goals they have set themselves, three different currents have developed in terminology schools.

The linguistic-terminological current, typical of the schools of Vienna, Prague, and Moscow, aims to standardise and ensure a clear and precise communication (Magris et al., 2002). In particular, the Prague school was interested in the structural and functional description of special languages, while the Moscow school was interested in the normalization of concepts and terms given the problems linked to multilingualism in the former Soviet Union countries (Cabr e, 1999). For this current, terminology is considered a means of expression and communication.

The normalizing current was born around the seventies to promote the use of minority languages, acts through linguistic policy programs and interventions by international institutions and organizations, also distinguishing multilingual countries where they try to replace terms from foreign languages with forms related to one's own language (Magris et al., 2002: 13).

The translation current characterizes multilingual international bodies and organizations such as FAO, the EU and UNESCO which intend to provide anyone who wishes and translators, the consultation of updated terminological databases in various areas in which each term presents an equivalent for each language.

#### **4.6 Prescriptive terminology and descriptive terminology**

Having in mind the goal of guaranteeing effective communication, the terminology conceived by W uster was prescriptive as it was based exclusively on the standardization of specialized domains whose terms were not considered in their real context of use and had to be univocal, nonreferential and unambiguous. It is possible to consider terminology in this way only in the case of communication between highly specialized experts, seen that some domains are subject to sudden changes and differences from country to country.

With the increasing use of terms and the need to find information in their context of use, a new type of approach has emerged. In fact, it has been realized that, within a discourse, the term can lose its nonreferential and univocal trait, giving rise to the phenomena of polysemy, homonymy and synonymy. Consequently, we moved from a purely prescriptive terminology to a descriptive one that starts from the real use of the terms and that deals with describing and explaining a specific domain (Cabr , quoted in Bedon, 2006).

According to Magris 2002, prescriptive terminology and descriptive terminology are both fundamental to the terminology work. In fact, on the one hand, terminological standardization must examine the use that users make of terms to later standardise them. On the other hand, without the normalization of the terms, confusion would be created, and the risk of incurring communication failure would be high.

#### **4.7 Terminological standardization**

In the field of terminology, polysemy, homonymy, and synonymy are an obstacle to communication and, for this reason, terminological normalization is a way avoid these diversity names and its purpose is to ensure communicative precision among specialists without forget that it must take a certain amount of variation into account, as without that the language would become sterile (Cabr , 1999: 199). The standardization process develops separately from real language. Therefore, in terminology, standardisation deals both with the “definition of norms on the principles and methods of the terminology activity, and [with] the elaboration of terminological norms relating to specific domains”; (Riediger, 2012: 7) guaranteeing, accordingly economy and precision <sup>7</sup>.

Terminological standardization takes place at the international, national and regional level. At the international level, three subjects deal with standardization: ISO<sup>8</sup>, CEI<sup>9</sup> and ITU<sup>10</sup>. The first was

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<sup>7</sup> Sager, J. C. (1990). A practical course in terminology processing, Amsterdam: Benjamins.

<sup>8</sup> International Organization for Standardization.

<sup>9</sup> Commissione Elettronica Internazionale. In English, International Electrotechnical Commission

<sup>10</sup> Unione Internazionale per le Telecomunicazioni. In English, International Telecommunication Union.

born in 1946 in place of the ISA<sup>11</sup> whose activities were interrupted due to the Second World War and, today, being the world standardization body par excellence, the ISO produces technical standards on products, services, processes and linguistic systems related to terminology and, specifically, the standards of the ISO / TC Technical Committee 37 discuss the principles, methods and applications of the terminology underlying terminological standardization (The Pavel Terminology Tutorial, 2011). According to Cabré (2000), the work carried out by bodies such as the ISO aims to promote a unification of terminology as a means of ensuring multilingual professional communication. CEI deals with standardization in electronic and electrical technologies, while UIT is an international body that is part of the UN system of organizations and develops technical standards in the form of Recommendations on telecommunications.

At a regional, European level, of course, there are the European Committee for Standardization (CEN), the European Telecommunications Standards Institute (CENELEC) and the European Telecommunications Standards Institute (ETSI). Finally, at a national level, in Italy, the Italian National Unification Body (UNI) addresses its standardization activity to the industrial, commercial, and tertiary sectors, excluding the electrical and electrotechnical sector which the Italian Electrotechnical Committee (CEI) deals with. (*Ibid*).

#### **4.8 Terminology and new methodologies**

Judging the traditional terminology too strict and far from reality, many criticisms have been made of Wüster's theory and some scholars have focused their research on the practical aspect of the terminology, possible thanks to the development of technologies.

From a prescriptive approach, the terminology has passed to a more descriptive approach and it has been understood that the use of technologies simplifies the extraction and collection of terminology, furthermore, developing more precise and updated terms. The term is no longer considered as something static as it is inserted in a discourse and is evaluated diachronically, as in the cases of terms of more recent origin such as *cloning* or *biotechnology*. This also means that the boundaries between terminology, terminography and lexicology are less marked. In fact, previously terminography was used to indicate the denomination of concepts and lexicology

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<sup>11</sup> International Federation of the National Standardizing Associations

when researchers started from the term and arrived at the concept. Nowadays the terminographer carries out a job like that of the lexicologist because by examining the terms, it takes into consideration the communicative context in which they are inserted.

Therefore, the terminology “has a social need and attempts to optimize communication among specialists and professionals by providing assistance either directly or to translators or to committees concerned with the standardization of a language.”<sup>12</sup>

#### **4.9 The term**

As quoted in Riediger (2012) The ISO 1087 standard defines *term* as a phonic and / or graphic sign - a word, a group of words, a compound word or a phrase, an abbreviated form - or a symbol that allows you to express a special concept relating to concrete or abstract objects [...] uniquely definable all within a specific discipline.

It is therefore possible to distinguish a term from a word by the univocity of the relationship it establishes with the specialist concept within a domain, the stability or continuity of the relationship between the lexical form and the semantic content, the frequency of use and invariability of the context, any graphics highlighted within the text and the limited combination of grammatical structures in which it appears (The Pavel tutorial, 2011).

Although the term is to be considered in its objectivity, it is difficult to completely estrange it from the general lexicon because it is part of it. As Cabré (1999) argues, it is when we consider the term as a pragmatic and communicative unit that we can distinguish it from words. The distinguishing feature of terms is their intension, that is, the amount of condensed information they convey.

It follows that the identification of terms within a text is a rather arbitrary process of terminological activity. The terminographer can decide to insert all the terms belonging to a domain that uniquely designate a concept or keep the most relevant terms leaving out the discounted ones that would weigh down the terminographic collection (Magris et al., 2002).

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<sup>12</sup> Cabré, M. T. (1999). Terminology: theory, methods and applications. Edited by Juan C. Sager, Philadelphia: John Benjamins pp 10.

According to Ahmad et al. (1994), in the phase of choosing the terms, the audience to whom the collection is addressed and the purpose of the terminographic collection must also be considered. Especially from a multilingual point of view, one inevitably collides with different cultures and different types of public, from experts to less experts, and therefore, depending on the factors considered, different terminological databases can be developed.

The terms can be simple or complex. The former consists of a single word that is delimited from other words within a sentence by whitespace. Instead, complex terms can be formed by one or more words separated by whitespace or joined by hyphens, but which make up a single expression that takes the name of a terminological phrase.

#### 4.9.1 Terms and concepts

The peculiarity of the term lies in the relationship it establishes with the concept that is designated by the term itself within a domain and in its degree of special reference, that is, in the fact that it is inserted into a conceptual system of a specific domain. The concept includes those specific characteristics of single objects, concrete or abstract, or of entire classes of objects that determine the concept itself and allow it to be inserted within a conceptual system (Riediger, 2012).

The ISO 704 standard of 1987 defines the concepts as mental constructs that are used to classify the individual objects in the external or internal world by means of an arbitrary process of abstraction [...] [and] the result of a selection process of the salient characteristics defining a class of objects and not the individual objects themselves.<sup>13</sup>

What differentiates the concepts are characteristics that reflect the properties of the concepts themselves. Cabré (1999) distinguishes these characteristics based on relevance, the relationship between the characteristic and the object and based on the internal hierarchy. For relevance, we have essential characteristics that describe the essence of the concept and are, therefore, necessary, and complementary characteristics that are not relevant to the description of the concept but add information. According to the relationship that the characteristic has with the object, there are intrinsic characteristics that describe the concept as representative of a class and

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<sup>13</sup> Cabré, M. T. (1999). *Terminology: theory, methods and applications*. Edited by Juan C. Sager, Philadelphia: John Benjamins.

extrinsic ones that are not part of the description of the concept as representative of that class. Finally, according to the internal hierarchy, characteristics can be dependent which means they must occupy different levels within a concept tree and independent in which they can occupy different levels of a concept tree and are combined in an arbitrary way.

The concept also deals about extension and understanding. The extension is given by the set of objects to which the concept is applied, while understanding refers to the set of characteristics that define the concept<sup>14</sup>.

The semantic stability between concept and term is called the degree of lexicalization, it strongly depends on the principle of univocity and is so important that, should it fail, semantic vagueness would be created.

#### **4.10 Terminology vs lexicology, lexicography and terminography**

There are two disciplines closely related to terminology: terminography and lexicology. In addition to these, lexicography must be added too. Given the nature of this thesis, it is good to make distinctions between these disciplines to better understand the meeting points and the major differences between them.

While considering lexicography related to lexicology and, therefore, a linguistic discipline, lexicography shares an interest in content with terminology. Lexicology and lexicography deal with the words of the general language and take care of the compilation of dictionaries, but, if we talk about terminological lexicography, that is, lexicography applied to special languages, it is easy to get confused with terminology. The essential difference between lexicography and terminology lies in the approach adopted. Lexicography works start from the linguistic sign and meaning to arrive at the concept, while terminology first questions the concept and, only at a later stage, the term<sup>15</sup>.

Therefore, terminology should not be considered on the same level as lexicology and lexicography as, as Sager cited in Magris (2002) writes [terminology] distinguishes itself from

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<sup>14</sup> Pavel, S., Nolet, D. (2001). Handbook of terminology. Translation Bureau, Canada.

<sup>15</sup> Rey, A. (1995). Essays on terminology. Amsterdam: John Benjamins.

the many branches of linguistics by having its starting point in extralinguistic facts, i.e., elements of human perception, observation, and knowledge.

However, opposing views of other scholars should not be omitted, such as Cabré (2000), according to which terminology is part of lexicology because it is considered as the information that constitutes the object of the documentation. However, to carry out certain activities concerning information, the documentalists, using terminology, move between the real terms, which they find in the documents they describe, and the normalised terms, which they must use to make their work efficient. In this way, real and standardized terminology coexist in documentary work making it difficult, during the terminological activity, to identify distinctive characteristics for these disciplines.

If terminology is the discipline that studies concepts, terms and their use, terminography is the practical application of the terminology that records, processes and presents the terminological data collected during terminological research<sup>16</sup>. The goal of terminography is to standardise terms by discarding those variants that are deemed not totally representable of a given concept. In fact, for the terminography, the terms are considered together with the form and the content. This relationship is clear and precise and occupies a fixed place within a conceptual system where all concepts are related to each other<sup>17</sup>.

#### **4.11 The importance of the figure of the terminologist and of the terminology for translation**

In a terminology project, the terminologist plays a key role. First, it deals with terminography by processing mono or multilingual collections and using precise terminological planning methodologies as it creates and elaborates terms by standardizing terminology and verifying their use; it also contributes to the dissemination of terminological databases and provides consultations to users of databases and training courses on terminology. Corbeil quoted in Cabré (1999) considers the terminologist as a technical aid in a multidisciplinary field. As a mediator, the terminologist works alongside the domain expert and carries out the terminological activity

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<sup>16</sup> Riediger, H. (2012). Cos'è la terminologia e come si fa un glossario.

<sup>17</sup> Cabré, M T. (2000). La terminologia tra lessicologia e documentazione: aspetti storici e importanza sociale



guaranteeing that objectivity that could be lacking with the specialist on the subject. The expert is available to help the terminologist in understanding the domain and will only take care of the terminological activity to check the work done by the terminologist and validate the terminographic cards.

Unquestionably, the terminology, with the figure of the terminologist, is a relevant activity for social needs. Thanks to the terminology, knowledge is transmitted, communicated without difficulty and tools, terminological databases, are provided. Thanks to the use of the Internet terminological database can be consulted by anyone and can help translators, interpreters and any figure accessing the terminographic collections. In particular, the terminology helps a translator in the phase that precede the translation, by reducing working time and familiarizing the translator with a specific domain.



## **5. Corpus and terminology**

### **5.1 Introduction**

After explaining the field of terminology this chapter will explain its connection with the corpora. A corpus is a collection of texts selected and organized in such a way as to meet specific criteria that make them functional for linguistic analysis. According to Taylor 2018, a corpus allows the reader to have a detailed vision of the word by zooming on different field and levels of focus. “A particular strength of the corpus linguistics approach is that it offers a bird’s eye view, looking at multiple occurrences simultaneously, which enables identification of patterns.” (Taylor; 2018) The so-called linguistic corpora (sing. corpus) are mostly large collections of oral or written texts produced in real communicative contexts (e.g., recordings of speeches or newspaper articles), stored in electronic format and often equipped with computerised consultation tools.

### **5.2 Corpus**

A corpus is a collection of texts selected and organized in such a way as to meet specific criteria that make them functional for linguistic analysis. According to Taylor 2018, a corpus allows the reader to have a detailed vision of the word by zooming on different field and levels of focus. “A particular strength of the corpus linguistics approach is that it offers a bird’s eye view, looking at multiple occurrences simultaneously, which enables identification of patterns.” (Taylor; 2018) The so-called linguistic corpora (sing. corpus) are mostly large collections of oral or written texts produced in real communicative contexts (e.g., recordings of speeches or newspaper articles), stored in electronic format and often equipped with computerised consultation tools.

From a statistical point of view, a corpus is a sample extracted from the population of all texts produced in a certain language, in a certain period, in a certain register, etc., based on which we can draw conclusions that apply to the sampled population. For example, by analysing a corpus of newspaper articles published in Italy in the 1990s we can formulate generalizations which, if the

corpus is sufficiently large and varied, are generally valid for Italian journalistic texts of the chosen period.

A reference corpus is proposed as a representative sample of a language in all its aspects written and spoken, registers and variety of use, etc. This objective, however, is never fully attainable, for practical reasons (data collection would require enormous costs) and theoretical reasons (how many and which registers and varieties should be sampled? in what proportion? etc.).

Specialist corpora focus on texts of a specific type, e.g., texts from the web, a technical language, the spoken language, or a given historical period.

The consultation tools usually respond to the query with information on the frequency of occurrence of the searched string and with concordance lists, which show the searched string in the contexts in which it is found within the corpus. It is also increasingly common that the consultation tools produce various automatic analyses of the occurrence of the searched string, extracting for example the typical placements of a word, i.e., other words that tend to occur with the searched word in a statistically significant way.

The advent of the computer age has revolutionised the nature, role and use of corpora the computer allows you to:

- store previously unimaginable amounts of text data
- query the content of the corpus in an advanced way
- perform new forms of processing and computation on the linguistic data.

Nowadays there are different type of corpora divided by their specificity:

- **General Corpus:** Corpus composed of language data that cannot be classified under a single gender, but which considers several variables of a language. The objective is to compile the descriptive framework of a particular language.
- **Specialized corpus:** These corpora aim to describe either language-specific variables (spoken vs. written) or domain-specific variables (special languages).
- **Bilingual or multilingual corpus:** Consisting of language data of two or more languages
- **Corpora parallels:** they are a series of original texts in a source language and their translations into one or more languages. There are various models (Johansson 2003):
- the one-directional model, which contains texts in only one source language (e.g., English) and their translations into only one target language (e.g. Italian);

- the 'bi-directional model' (Johansson 2003), which contains original texts in two languages (e.g., English and Italian) and their corresponding translations into the same two languages (i.e., English to Italian and Italian to English);
- the 'star model' (Johansson 2003), consisting of original texts in one language only (e.g., English) and its translations into two or more languages (e.g., Italian, French, German, Portuguese etc.);
- the 'diamond model', in which appears original texts in three (or more) languages (e.g., English, Italian and French) and the combined translations (e.g., English to Italian and French, Italian to English and French and French to English and Italian).
- **Comparable Corpus:** A comparable corpus, on the other hand, is made up of a series of original texts or translations only, written in one language (monolingual corpora) or several languages (multilingual).

The methodology of corpora applied to translation analysis is still a rather recent research phenomenon, but it can offer significant contributions both in terms of advanced linguistic analysis and as a didactic tool for teaching and acquiring foreign languages, for the learning of specialist languages. The use of corpora in the study of translation not only makes it possible to identify important syntactic, grammatical and syntactical aspects of two or more reference languages through the direct comparison of original texts (source texts, or ST) and translated texts (target texts, or TT), but also represents a valid support and learning tool for professional translators, students and other subjects (native speakers and non-native speakers) who wish to acquire an adequate knowledge of terminology, style and concept of certain languages and language genres.

### 5.3 Corpus language and terminology

The terminology did not always mix very well with the texts. The Wüster tradition even warned against using actual productions to constitute terminologies. It is only recently, under the pressure of various parameters, that the constitution of terminology from texts has taken a considerable step forward. One of the consequences of this development is that terminology as a scientific discipline has moved closer to linguistics. Indeed, linguistics itself is at a major turning point in its history: the corpora are now easily available (even if it is worth wondering about this ease of access,

especially on the internet) and to query them are also accessible. Taking corpora into account thus questions linguistics in many areas: morphology, syntax, discourse, semantics, etc.

Textual terminology emerged at the very time when linguistics corpus was developing, the semantic one.

#### **5.4 Corpus linguistics and computer science**

Corpora have nowadays become the main material of NLP (Natural Language Processing). In this perspective, it is mainly a question of processing large quantities of textual data on electronic media; corpus linguistics is therefore considered from an NLP perspective. According to Kennedy (1998) over the last three decades the compilation and analysis of corpora stored in computerized databases has led to a new scholarly enterprise known as corpus linguistics. The objectives of corpus analysis can be vastly different: acquisition of morphological, syntactic, or semantic knowledge to improve the performance of tools, information extraction, information search, question-answer system, computer-assisted translation, scientific watch, etc.

This need for terminological data has emerged clearly in companies that have to manage considerable documentation, in connection with the creation, development and maintenance of manufactured objects. The main resource that feeds EDM (electronic document management) tools consists of terminology specific to the field covered, or even the company concerned.

#### **5.5 Application to the medical field**

Computational terminology is characterized by its interdisciplinary component. The main objective of this paragraph is to present and analyse the complexity of medical language and to show how computational terminology can be useful. The medical field brings together people from different social statuses, such as students, pharmacists, biologists, nurses and mainly doctors and patients, who are the main actors. Despite their different levels of expertise, these actors must be able to interact and understand each other without ambiguity: however, communication is not always easy and effective. For these reasons, it is necessary to simplify medical text in terms of

readability and comprehensibility of terminology and implement applications intended to facilitate dialogue between people with different levels of expertise in medical diagnostic situations.

In this section, we consider such systems, approaches and methods designed to promote the correct transmission of medical information in the interaction between physician and patient. Indeed, the two interlocutors can interact in different ways: oral dialogue such as during a medical consultation or written form, through the drafting by the health professional of medical files constituting a set of documents which trace episodes that affected the patient's health (letters, notes, reports, laboratory results, etc.). This application category of computational terminology has been identified to present the work that exploits the combination of terminological and computational approaches reflecting the improvement and support of health care. As we mentioned earlier, the medical industry includes people with different levels of expertise. The resulting problem, especially in the interaction that goes from a specialist level to a non-specialist level is the lack or misunderstanding of medical information by the non-expert in the domain.

A large part of the studies of computational terminology applied to the medical field are devoted to the development of applications to facilitate the understanding of specialized information by the nonexpert. For the patient to optimally understand the message conveyed by the healthcare professional, it is essential to adapt the specialized terminology to a commonly understandable language register. In this sense, the studies presented below aim at the development of automatic systems for:

- simplifying the text,
- classifying terms according to technicality, comprehensibility, and specialization,
- analysing terminological variation.

Generally, text simplification is a research application of computational terminology closely related to readability studies (DuBay, 2004), the aim of which is to provide a document that is readable and understandable by anyone. In natural language, the readability of text depends on its content and on its form. For medical texts, the main difficulty that prevents non-experts from easily understanding the text is the complexity of the terminology used to express specialized concepts. In this sense, the work of Grabar and Hamon (2014) proposes an automatic method based on the morphological analysis of terms and on text mining to detect paraphrases of technical terms in French that can be understood by non-experts. The authors propose to exploit the texts of social

networks to identify paraphrases of technical medical terms. Simplifying the text is therefore one of the tasks of computational terminology applied to the medical field.

The concept, its definition (and its term) necessarily belongs to a domain. [...] The domain is used to indicate the conceptual system to which the concept belongs to. The term and its definition therefore take on meaning when they are linked to a specific domain. In the file, we therefore identify the domain (“medicine”) and the sub-domains of use of the term, for example “surgery”, “pathology”, “pharmacology”, etc. The card also offers the specification of the language register level in which the term is used: “popular”, “slang”, “familiar” or “standard”. In particular, the terminology file pays attention to the phenomenon of register variation, or diastatic variation of the language.

## **5.6 Corpus as an object of study**

Some disciplines consider that once developed, the corpus constitutes the reference to their work. In all cases, the corpus must be constructed in a coherent manner, or it must emanate from an identified group of speakers. A priori as is the case in sociolinguistics, discourse analysis or even the theory of sub-languages (Dachelet, 1994), whether it is constituted from a particular perspective as in NLP or textual terminology. By limiting the scope of the results to the corpora in which they are interested, these disciplines have the merit of perceiving the limits of their approach. However, asking little about the methods of broadening these results, they leave aside fundamental questions for linguistics, which make it possible to explain the very functioning of language using shared knowledge.

Rooted in the reality of uses, these corpus-based approaches bring out a major element, particularly for semantics. Indeed, most of them consider that meaning is not a given, but a construct and that the corpus is subject to an interpretation. From such a perspective, the question that arises is to know what the possible modes of control of interpretation are.



## 6. TriMED

### 6.1 Introduction

TriMED is a multilingual terminological database. It was created to face the several problems concerning the complexity of medical terminology. This database works for three different languages: Italian, English, and French. Technical terminology and a closed nomenclature can create several problems for communication in the medical field. Medical language indeed contains geekism, Latinism, archaism and scientific terminology that sometimes cannot be understood easily by people. A study conducted by Grabar *et al.* in 2014 has the purpose to simplify medical texts. they propose a specific terminology collection to evaluate those terms that are not understandable; they need further explications.

### 6.2 TriMED users

The TriMED database conceive three different categories of users:

- Physicians: English is nowadays considered as a lingua franca; it is also the language used to communicate in many fields including the medical one. In terms of spreading the knowledge of new treatments and research, especially in this period of global pandemic outbreak due to Covid-19, it is important to have a shared lexicon. At a specialist-to-specialist, level of communication, physicians need to be able to cross these language barriers and access to research information and terminology. This process allows physician to apport a knowledge and research on their territory and implement the research net.
- Translators: translation has a fundamental role in communicating and disseminating information. The scientific translator must face different phases of decoding and transcoding of the medical language. In this case we have a specialistic an semi-specialistic level of communication. The translator needs terminological resources to produce an accurate translation of the source text.

- Patients: The scientific and technological development, which has such an impact on medicine and its diagnostic and therapeutic capacity, has gradually shifted the focus of physicians' attention away from the patient and towards the disease itself, and this has led to a crisis in the doctor-patient relationship. This has led to a crisis in the doctor-patient relationship: the public has considerable difficulty in understanding information about their own health. Patients (or their caregivers) need to be able to understand their health information. communication is effective, patients would need to understand the term specialist physician through the use of its reformulation in "popular" language or non-specialised language.

### **6.3 Structure of TriMED**

TriMED terminological entries have three levels of communication:

- Specialised level: it provides the scientific communication between specialists in the field and the corresponding translated terminological entry to the appropriate language register level;
- Semi- specialised: it provides information useful to the technical- scientific translators for the translation of specialised texts;
- Non- specialised level: it provides popular definition to facilitate proper understanding by the patients and the equivalent of the term commonly used in popular language.

TriMED terminological entries are focused to create a clearer communication in the medical field. The terms in the database are understandable, clear, and accessible to everyone. This database considers the diastratic variation of the medical specialised language.

### **6.4 Terminology file**

The terminology file o sheet is the core of any collection of terminology data (glossary, database, knowledge base, etc.). It is defined as a “structured set of terminological data referring to a concept”<sup>18</sup> and contains all information regarding a term. Depending on the function and its destination, it is necessary to enter data in the card. A good terminology card with a translation

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<sup>18</sup> ISO 1087, 6.1.3

function can contain the following conceptual and linguistic fields. The number and sequence of fields varies according to the needs and / or purpose of the terminology collection.

#### 6.4.1 Domain

It contains the field to which the term belongs to (medicine, economics, chemistry, photography, etc.). It is possible to use the large classification systems used by terminological databases (eg. Lench) or in the library field (eg Dewey). The important thing is that the classification is easily applicable. It is useful to use codes independent of the language in analysed. The choice of codes requires careful consideration to place the term in the relevant domain. It can often be useful to assign even more material codes. Thus, for example the term <environmental legislation> could be attributed both to the domain “environment” and to the domain “law”.

#### 6.4.2 Subdomain

It contains indications that restricts the field in which the term is situated. So, for example the term <borderline disorder> could be placed in the subdomain “psychiatry and psychology “of the domain “medical and biological sciences”.

#### 6.4.3 Term

It contains the term the card refers to: this can be a simple term <building > or compound <commercial building>. The terms must be registered in lowercase or uppercase according to their actual use and in their basic form (nouns in the nominative singular, verbs in the infinitive, etc.), while the syntagms (phrases and complex terms) appear in their natural order.

#### 6.4.4 Genre

It indicates the genre to which the terminological unit belongs to : masculine, feminine, neutral whether the language allows it.

#### 6.4.5 Variations

It contains terms that, while maintaining the same semantic value, deviate from the main term in spelling or writing. Variants can be abbreviations or acronyms or vice versa the extended form of acronyms or abbreviation.

#### 6.4.6 Status

It provides information on the processing steps to which the term has been subjected. Such indications, such as "validated", "to be verified", "deleted" are important if the database is compiled by several people or is subjected to various levels of verification.

#### 6.4.7 Definition

A fundamental element of each terminological sheet is a statement that defines the concept and allows it to be differentiated from other concepts within a conceptual system. It summarizes the semantic content of the concept concisely and must never contain the term defined. The function of the terminological definition is to define in the sense of describing, delimiting and distinguishing concepts within a given conceptual system, and not to provide encyclopaedic information.

#### 6.4.8 Source definition

It indicates the bibliographic reference, document, or resource from which the definition was extracted or inferred.

#### 6.4.9 Illustration or hyperlink

As a supplement to or as an alternative to the definition, the terminology sheet can contain an illustration or a hyperlink to an audio or video file.

#### 6.4.10 Context

It contains a portion of text in which the term is used that allows us to grasp its meaning within a context of use. Sometimes it can also be of a definitional nature and therefore it can be added to the definition or replace it.

#### 6.4.11 Context source

Indicates the bibliographic source from which the example was extracted in the context of terms and syntagmatic units.

#### 6.4.12 Ontological relations

There are different types of relationships between terms that are part of a conceptual system. The most common are hierarchical relationships (hypernyms-hyponyms) and coordination (synonyms, antonyms, associated terms). The description of these relationships can be made in a single field or in different fields or subfields, denoted according to the type of relationship:

- Synonyms: it contains terms that designate the same concept as the one selected and which can be interchangeable in any context.
- Quasisynonyms: it indicates terms in which the degree of synonymy is such as to designate the same concept, but the terms are not interchangeable in the various contexts. The degree of synonymy can also be indicated using the following symbols:
  - = perfectly equivalent meaning
  - ~ meaning more or less equivalent
  - < more limited concept of meaning
  - > broader concept of meaning
- Synonym of: it contains terms with a synonymous relationship with another classified as the main term in the database. This item appears only in the form of the term synonym.

- Antonym of: it contains terms with an antonymic relation with another classified as the main term in the database.
- Hyperonyms: it indicates hierarchically superordinate terms that have a lower degree of specificity than the term examined. (generic vs. specific).
- Hyponyms: it indicates those terms that are hierarchically subordinate to the main term and have a greater degree of specificity than it. (specific vs, generic).

#### 6.4.13 Compilation date

It indicates the date on which the form was completed or updated.

### **6.5 The phases of the realization of a terminological research and collection**

It is possible to affirm that the terminology work can take place in three different phases: preliminary phase in which we explain the purpose of the terminological research; main phase in which we extract the terms and fill in terminological sheets; final phase in which we present the work in a form of glossary or terminological database.

### **6.6 Terminology research approach**

Terminology research can be systematic or punctual. The punctual research is the fastest one and it has the aim to solve a specific terminological problem, such as the need to know the meaning of a term or find its equivalent in another language. It is one of the activities that characterize the daily practice of translators and interpreters. The systematic research on the other hand, provides a detailed and exhaustive collection of documents, generally in several languages, concerning a given domain , to clarify concepts and identify the equivalents . Terminology extraction is the activity of identifying relevant terms in a text or corpus of texts. The extraction can be manual, semi-automatic or automatic. In manual extraction, the texts are read and the candidate terms for the terminology collection or glossary are copied or transcribed. For the semi-automatic extraction, concordancer are generally used. The automatic extraction, on the other hand, takes place through

dedicated software, the so-called terminology extractors that compare the text with internal dictionaries and filter the potential terms of interest based on recurrence, specificity and level of ambiguity. The extraction can be monolingual or bilingual or multilingual. The monolingual extraction is aimed at identifying candidate terms, while the bilingual or multilingual extraction is based on the analysis of source texts and related translations to identify potential terms and their translators.





## 7. Conceptual field

### 7.1 Introduction

In 1934 J. Trier, considered the father of the linguistic notion of lexical field / linguistic field,<sup>19</sup> expressed the observation according to which there was a terminological confusion on the linguistic category of field. The history of the search for the meaning of the methodology of the fields, identified within the expressions “lexical field” and “semantic field”, is complex and dispersive in summary, it is possible that the expression “lexical field” has assumed its own physiognomy universally recognized, while the category of “semantic field”<sup>20</sup> would have been semantically absorbed by the other. Thanks to the important theoretical contribution offered by the Romanian linguist Eugenio Coseriu, of the School of Tübingen, today we can refer to a priority and majority meaning of “lexical field”, conceived within a “lexical solidarity”. A lexical field [Wortfeld] is, in the structural perspective, a lexical paradigm that arises from the segmentation of a lexical continuum of content into different units that in the language are presented as words: these units are arranged in immediate oppositions to each other by virtue of simple semantic distinctive traits<sup>21</sup>. Roman Jakobson, advancing Ferdinand De Saussure’s studies, distinguishes two axes in the functioning of the language: that of combination and that of selection. De Saussure already stated that the syntagmatic axis combines the relationships between words in praesentia, while the paradigmatic one is the axis of choices and relationships in absentia. Within this scheme, which goes back to general linguistics, is the space of the “lexical field”. According to the theory developed starting from J. Trier up to E. Coseriu, it belongs to the paradigmatic linguistic axis, the axis of “selection”, with reference to “lexemes”<sup>22</sup> organized, according to the structure of a vocabulary, into “headwords”. Each of these is bearer of meanings and therefore semantically

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<sup>19</sup>With reference to the terminology of the “lexical field”: German: Wortfeld (sprachliches Feld); ing .: lexical field; fr .: champ lexical; sp .: léxico field. The theory is expressed in J. Trier’s work

<sup>20</sup>The expression “semantic field” appears for the first time in G. Ipsen in 1924 (English: semantic field; fr.: champ sémantique; Spanish: semántico field)

<sup>21</sup>JAKOBSON, Essai de Linguistique générale

<sup>22</sup>Linguistic sign carrying minimal semantic units with extra-linguistic reference

connoted: the “lexical field” is nothing other, as E. Coseriu states, than a “lexical paradigm”, composed of lexemes in opposition to each other. The field of words is wider than that of “lexemes” as understood by theory. E. Coseriu concludes that only lexematic words fully belong to the lexicon and, consequently, to the main object of lexicology.

## 7.2 Lexical field’s problems

One of the greatest shortcomings of all the investigations carried out up to now on the lexical fields consists in the lack of a method, of a linguistic technique with linguistic procedures; since there is no elaborate method for the field, the analyses were mostly done on an intuitive basis. In order for the field theory to be definitively validated, a method is needed, the creation of which has for years been the aim of Coşeriu’s studies in the field of structural semantics. Coseriu’s in his studies affirmed that there is a *semantic configuration* of a field that becomes a real *linguistic structure* only by virtue of the distinctive oppositions. We must therefore suppose that every conceptual field has a unitary *content*, and that this content is divided by oppositions between *terms* within the field itself. By virtue of its unitary value, however, the field is opposed to other fields in other words, from the practical point of view, a field is established by virtue of simple oppositions between words and has its limit where a new opposition would require that the unitary value of the field become a distinctive trait, that is where the words as such are no longer opposed, but the whole field becomes the term of an opposition of a higher order. Coşeriu’s conception on the lexical field can be summarised into two fundamental elements: the principle of functional oppositions and the analysis of the content in distinctive features (1971). Coşeriu is interested not only in the structural form of the lexical field, but also into the examination of lexematic structures in general, within which he attributes a very precise location to the lexical field.

Coşeriu points out that the immense size of the lexicon (and with it the large number of lexical units to be examined) does not represent any obstacle to research, but rather an empirical difficulty. Coşeriu proposes a reduction of the complex material to be analyzed, operating it based on a series of important distinctions.

### 7.3 Preliminary distinctions

#### 7.3.1 Distinction between “extra-linguistic reality” and “tongue”

The main difficulty consists in the proximity of the conceptual function to the reality designated by the lexemes, since the lexicon is the last linguistic layer before the transition to reality; in language it represents the layer that immediately meets extra-linguistic reality. Consequently, it is difficult, but important, to distinguish what belongs to linguistic meaning and what belongs to the knowledge of things. The question of the specialized lexicon, of terminology falls within this framework. The terminology simply corresponds to a nomenclature and as such is not structured based on the language, but on the basis of extra-linguistic reality, according to the objects of the corresponding discipline.

Scientific language knows only oppositions “*exclusive*”, which means that one term cannot cover the field of another term (for example in chemistry “*acid / base*”), while in common language oppositions are presented “*inclusive*” which means that the non-marked term of an opposition can cover the semantic sphere of the marked terms (for example, in the pair “*day – night*”, the word “*day*” is the opposite to the word “*night*” but it can also mean “*day + night*”, i.e. 24 hours (Coșeriu 1971: 240); since in terminological usage the words both options are valid. In this case they coincide, while they must necessarily be separated in the context of the language “*natural*”.

The terminologies are, on the one hand, “*under - idiomatic*”, they belong to some limited fields within each idiomatic community; on the other hand, they are “*interidiomatic*”, they belong to the same type of field in different idiomatic communities. This is also due to the fact that scientific language is a designation system and concerns the search for the real itself.

The (limited) nomenclature systems such as the names of the days of the week, the months of the year, measurement systems for weight, length, etc., also the names of different types of food, mostly clothing or the different terminologies conventional: legal, administrative, political, such as popular terminologies and nomenclatures remain outside the descriptions of the history of languages as systems of signification since “they involve a traditional competence of a non-linguistic character” (Coșeriu cit. in Lazăr 2001: 82).

Coşeriu affirms that the important thing is that we recognize what is called the lexicon of a language, the existence of vast sections purely “*designative*” whose only possible structuring is the enumeration, and others that are structured, the existence of a “*structured lexicon*”, linguistic, and a “*nomenclator and terminological lexicon*”;(Coşeriu 2007: 184).

Thus, in a structural methodology, in the meantime, everything that is terminology and nomenclature is excluded, at the same time obtaining for the analysis a considerable reduction of the almost unlimited number of units of the global lexicon.

The relationship between linguistic structures and the structures of extra-linguistic reality is important for the investigation of lexical field. Namely the fact that in extra-linguistic reality there are no clearly determined limits between what, for example, current contents express “*jeune-adolescent-adulte-vieux*”, this fact is often interpreted as proof of the subjective and imprecise nature of the linguistic structures of the content. This reasoning is based on a fundamental error: “linguistic values are conceptual values that are defined through their oppositions and their functioning and not based on criteria “and the limits, precise or imprecise, existing between the phenomena of reality” (Coşeriu 2007: 186).

- The difficulty of separating classes of phenomena of reality does not concern the distinction of the respective concepts: on the contrary, such difficulties show that the concepts are clearly separated. Thus, the fact that in the extra-linguistic reality there is no clear limit between “*day*” and “*night*”, but it does not mean that the “*day*” and the “*night*” are inaccurate. The precise delimitation of concepts is opposed to an imprecise delimitation of phenomena conditioned by the nature of the extra-linguistic facts themselves.
- Non-coincidences in the use of lexical elements about a given fact do not imply a semantic non-coincidence of these elements with themselves. Examples: “*This coffee is hot. No, it is cold*”; “*You are rich. No, I am poor*”; “*You are young. No, I’m old*”; they do not demonstrate a contradiction in the content of the adjectives, but disagreement on the evaluation of the facts. The non-coincidence in the use of these adjectives does not concern their meaning, the question is rather whether a given fact must be “*designated*” with one or the other adjective. Non-coincidences of this type therefore do not concern linguistic contents but presuppose them (Geckeler 1979: 145).
- Language does not only make distinctions that coincide with limits. It also draws limits in

areas for example: colour adjectives that can be “*yellow-green-blue*” ... distinguishes them from relationship adjectives which can be “*big, small*” ... These distinctions therefore do not relate to structures of extra-linguistic reality but are to be considered as structures that human interpretation imposes on reality through language. In this sense, Coşeriu affirms that we must begin by establishing that we are not dealing with structures of reality, but structures forced into reality by human interpretation. (Coşeriu 1987).

- However, the language can renounce distinctions, which instead are clearly given in the extra-linguistic reality. So, the object “*escalier*” is clearly separated. In Italian, Spanish, and English it has a correspond to a single sign in the language which are “*scala*”, “*escalera*” and “*ladder*”.

In conclusion, considering the particular importance of the distinction between the “*knowledge of words*” and the “*knowledge of the world*” during the perspective of the analytical-descriptive approach, certainly the distinction between the “*semantic dimension*” and the “*real dimension*” are involved in the knowledge of the lexical meaning. In another situation a real opposition involved in the relationship between things themselves. For example, the opposition “*little*” “*big*” is linguistically relevant in the structuring of the micro field because the semantic dimension is included in the relationship between these lexemes.

### 7.3.2 Distinction between “tongue” and “metalanguage”

The “*primary language*” is the language whose object is non-linguistic reality; the “*metalanguage*” is a language whose object is itself. Designated by the metalanguage are elements of the primary language (or, in general, of a language) (Coşeriu 2007).

Each element on the level of the expression (signifier) of the primary language can be used metalinguistically and for this purpose it is substantiated. The metalinguistic use constitutes an infinite possibility of discourse (words). It does not include any semantic structuring, since it deals with an unlimited nomenclature, in which each element is in opposition to all the other.

### 7.3.3 Distinction between “synchrony” and “diachrony”

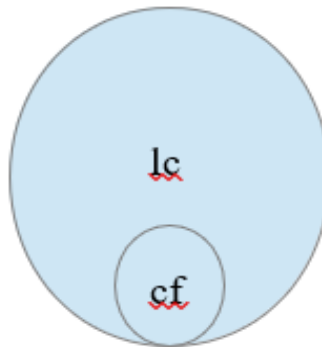
The distinction between “*synchrony*” and “*diachrony*” introduced by Saussure<sup>23</sup>, is well known and discussed extensively in linguistics. These two points of view must not be confused. Since the language is always *synchronic* in the sense that *it works synchronously* and yet *constitutes diachronically* (Coşeriu 1982). Within the synchrony we must differentiate and distinguish the *synchrony of structures* from the *synchrony of language* since functional structures can remain long in time, this means that their internal synchrony therefore exceeds their simultaneity with other structures of the language (Coşeriu 1882). While certain structures are maintained over time, others undergo a linguistic change, the language changes incessantly, but the change does not destroy it and does not damage the language in its being, which is always kept intact. This does not mean that being a system is not affected from the change, indeed, quite the opposite, because the change in the language has a radically different meaning from that of the change in the natural world. Change destroys objects and organisms in the natural world; while the change in language is a reconstruction, renewal of the system, and indeed ensures its continuity and its functioning. In a nutshell, it is observed that not all language is transformed as a single system, but that linguistic change always takes place within partial systems (or microsystems). The synchrony of language must always refer to a certain state of language (*état de langue*).

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<sup>23</sup> For Saussure, “static fact” and “evolutionary fact” are radical. The synchronic terms are “coexisting and form a system”, while the diachronic ones are “successive and replace one another without forming a system” (Coşeriu 1982: 172).

#### 7.4 Lexical field and conceptual field

Lexical fields do not identify with conceptual fields. Every lexical field is a conceptual field, but not every conceptual field is necessarily a lexical field since a terminological field can also be a conceptual field. It is true that every lexeme corresponds to a concept, but not every concept is necessarily rendered through a unique lexeme. It can also be expressed by a combination comprising several words: for example *“la guerre de Trente Ans”* is the expression for a certain concept. Schematically, the relationship between the lexical field (lc) and the conceptual field (cf) is the following:



#### 7.5 Conceptual systems and conceptual relationships

Among the concepts there are relationships, called conceptual ones, which can be represented in terminology with the aid of graphics and which, together with the knowledge of the domain, are inserted into a conceptual system. Thanks to the conceptual system, in addition to visualizing the conceptual relationships, it is therefore possible to compare the concepts with the corresponding designations to observe cases of synonymy or equivalence, depending on whether one looks at the designations within a language or at those of a other. Furthermore, the conceptual system guarantees precision and clarity as it unifies terminology and structures knowledge. As for the

conceptual relationships, it must be said that it is not possible to classify them all in a universally accepted system. For example, Felber (1984: 121-130) classifies them in

- logical relationships (they identify relationships of similarity);
- ontological relationships (indirect relationships based on contiguity in time and space);
- part-whole relationships; - succession relationships (based on contiguity over time);
- material-product relationships (they identify different phases in the production of a good, from the raw material to the finished product);
- effect relationships:
  - causal;
  - instrumental;
  - of filiation

while the ISO 704 and DIN 2330 standards (in Magris et al., 2002: 151) distinguish between

- hierarchical relationships:
  - genus-species (which links a concept to its different types and subtypes that inherit the characteristics of the generic trait plus an additional stroke);
  - partitive (between a quantity and its parts based on a relationship of contiguity. The part takes the name of meronym while the whole is called homonym);
- non-hierarchical relationships:
  - sequential;
  - chronological (successive phases of a process. For example, denaturation is a step of the polymerase chain reaction);
  - evolutionary (they identify different stages of an evolutionary process);
  - reasons;
  - instrumental (they link an action to an instrument used to carry it out);
  - pragmatic / associative (based on the thematic proximity between concepts whose links can be strong, weak or impossible).

Cabré (1999) also inserts the equivalence relations that identify synonyms, or quasi synonyms. Within a hierarchical conceptual system, concepts are subdivided into superordinate, at a higher level, coordinated, at the same level as another concept and subordinate, at a lower level. In detail, in the context of a generic relationship, concepts are inserted as generic concepts, at a higher



level, specific concepts , at a lower level, and coordinated concepts , at the same level as another. In partitive relations, concepts can be comprehensive, that is superordinate, or partitive, that is subordinate. The graphic representation of the conceptual system, the so-called concept map, is a useful tool for the quick and clear visualization of conceptual relationships, but the reality is much more complex. In addition to the innumerable types of relationships that can be formed, the concepts themselves can belong to different relationships and can be classified according to different criteria. The speech becomes complicated when there are terms with multiple meanings which, consequently, can determine more variants of the system (Magris et al., 2002). Whatever system is elaborated, whatever conceptual map is drawn and whatever classification of relationships is chosen to adopt, it should be remembered that only a system of representation that would enable the user to view these relationships simultaneously or within a short temporal sequence can provide even a semi-adequate representation of these complex relationships. (Wright, Budin, 1997: 91).

## **7.6 Conceptual spheres on TriMED resource**

At a terminological level, the file takes into consideration the hierarchical relationships between the terms by providing information on the / hypernym / and the / hyponym / of the term analysed. At a conceptual level, this hierarchical representation by providing the categories of / superordinate concept / (higher level concept) and / subordinate concept / (lower-level concept) is normally maintained. Superordination and subordination relationships derive from the property of certain concepts to subsume other concepts, i.e., to include others under them. These categories of data will therefore contain the alphanumeric identifiers of the terminological entry at the conceptual level and will be linked to the identifiers of the terms designating these concepts and expressed in the hyperonymy – hyponymy relationship. The relations between the concepts are not only limited to the hierarchization between superordination and subordination. There are in fact other types of relations: coordination, association, opposition, etc. The TriMED terminology file clarifies these semantic links through the category of data / relation between concepts /. The last conceptual type of category provided by the TriMED terminology sheet concerns the / conceptual sphere / of the term. This expression refers to a macro-classification that groups together the concepts and,

therefore, the terms semantically linked by criteria specifically identified for the medical field.

There have been identified seven conceptual spheres classified as follows:

A - Diagnosis: types, methods, and tools (in particular, tests / examinations) for the investigations, evaluations, and diagnostic and prognostic formulations of diseases.

B - Epidemiology and prevention: prevention systems, methods of appearance, propagation, and frequency of diseases according to the conditions of the organism, the environment and the population.

C - Pathology: diseases, pathological conditions, disorders, and their signs (manifestations) and symptoms.

D - Medical specialties.

E - Pharmacology: drugs, chemicals, artificial preparations.

G - Anatomy: human organism, cells, tissues, organs, and systems.

H - Therapy: tools, techniques and surgical, preventive (or prophylactic) operations, supportive, psychological, or psychotherapeutic therapies for the treatment of diseases, pathological conditions and disorders.

Each term contained in the TriMED resource is therefore manually associated with a / conceptual sphere / according to the semantic field to which it belongs. For example the various specialties of medicine such as “virology”, “bacteriology” or “biology” will be grouped in the conceptual sphere D. Terms relating to pharmaceutical substances or chemical preparations, such as “alkaloids”, “chloroform” or “chloroquine” are grouped under the conceptual sphere E. The choice of this category of data therefore allows to group together semantically related terms. This category can therefore be classified as a more generic entity of the same concept. In this way, terms such as “diagnosis”, “diagnose” and “diagnostic” can be considered as three different concepts (each corresponding to its own terminological definition) indicating a practice, an action and a qualification, grouped under the same conceptual sphere A.

## 7.7 Analysis of the conceptual spheres on TriMED resource

### 7.7.1 Diagnosis

**Diagnosis**<sup>24</sup>: Identification of the disease, affection or injury, its location, and its nature. Identification is achieved through the evaluation of the various symptoms and signs presented by the patient, based on analogical reasoning. The procedure carried out by the doctor on the patient to formulate a d. takes place in two stages. The first phase is the observation of the symptoms the doctor must distinguish the essential symptoms from those of secondary importance and establish which symptoms of the morbid state are primitive and which should be considered because of the former. Subsequently, after having clarified the relationships between the different symptoms, he must decide which of the various known diseases corresponds most to the morbid state studied. The morbid picture only rarely appears so typical as to allow its identification with one of the diseases described by pathology : we can say then that the diagnosis is direct, because the symptoms detected are so characteristic of a given process not to allow mistakes. But in almost all cases, this identification can be done with certainty only after having established a comparison between the patterns of the different morbid pictures and the symptoms of the one to be diagnosed, and after having evaluated the differences and similarities presented by the symptomatic complexes. Therefore the d. it can be considered an analogue process. Having schematized the diagnostic procedure in this way and bearing in mind that it is essentially the result of analogies, it is easy to understand how attempts have been made, in recent years, to automate it. For example, by using an electronic computer capable of performing a analysis mathematics of an electrocardiographic trace it is possible to perform a d. electrocardiography within a few seconds.

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<sup>24</sup><https://www.corriere.it/salute/dictionary/diagnosi/index.shtml>

### 7.7.2 Epidemiology and prevention

**Epidemiology**<sup>25</sup> and **prevention**<sup>26</sup> : Part of hygiene that studies the frequency with which diseases and conditions that favour or hinder their development occur. Epidemiology is the basis for a rational disease prophylaxis. The study of a given disease in relation to a population can be conducted by evaluating the total number of cases, old and new, observable in a certain time called the prevalence rate. This method, at the base of the so-called descriptive epidemiology, allows to detect in statistical terms the frequency and distribution in the various strata of the population of various morbid phenomena. Investigations aimed at identifying the causal relationships between a given disease and the numerous individual and environmental factors that encourage its development, typical of the so-called analytical epidemiology, allow to evaluate the existence of risk factors and to implement adequate measures to eliminate them or avoid its action. Prevention, on the other hand, is the action aimed at preventing the occurrence or spread of unwanted or harmful facts (especially in medical, sociological, and legal language).

### 7.7.3 Pathology

**Pathology**<sup>27</sup> : Pathology is a branch of medical science mainly concerning the cause, origin, and nature of the disease. It includes examination of tissues, organs, body fluids and autopsies to study and diagnose the disease. Currently, the pathology can be divided into eight main areas, according to the types of methods used or the types of diseases examined:

- General pathology that describes a complex and broad field that involves studying the mechanisms behind cell and tissue injury as well as understanding how the body responds

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<sup>25</sup><https://www.treccani.it/enciclopedia/epidemiologia/>

<sup>26</sup><https://languages.oup.com/google-dictionary-it/>

<sup>27</sup>[https://www.news-medical.net/health/What-is-Pathology-\(Italian\).aspx](https://www.news-medical.net/health/What-is-Pathology-(Italian).aspx)

to and repairs the injury. Examples of areas that can be studied include necrosis, neoplasm, wound healing, inflammation and how cells adapt to the injury.

- Anatomopathology which includes the study and diagnosis of the disease with microscopic analysis of samples from body fluids, from tissue organs and sometimes from the whole organism or autopsy. Factors that can be examined include the appearance of the cells, anatomical make up and chemical imprints within the cells.
- Clinical disease involving the analysis of blood, urine and tissue samples to examine and diagnose the disease. Examples of information clinical pathology labs can provide include blood count, blood clotting, and electrolyte results.
- Chemical pathology or biochemistry that examines all aspects of the disease, identifying changes in various substances found in the blood and body fluids such as proteins, hormones, and electrolytes, as these changes can indicate and information about disease or the risk of disease.
- Genetics which include testing chromosomes, biochemical markers and DNA captured from body fluids and tissues to detect genetic diseases.
- Haematology that cares about a variety of different disease aspects affecting the blood, including bleeding disorders, clotting problems and anaemia, for example. Another field of haematology is transfusion medicine, which involves performing blood typing, inter-matching for compatibility, and managing many blood products. An example of a test that a haematologist can perform is a blood clotting test to check whether a patient's dose of warfarin should increase or decrease.
- Immunology performing analyses functionals to establish whether a patient is suffering from an allergy and if so, to which they are allergic. Many diseases also arise as a result of the immune system having an abnormal reaction to healthy cells or tissues and launching

an immune attack against them. This is referred to as an autoimmune disease. There is a range of immunological tests that can detect markers of autoimmune diseases such as rheumatoid arthritis, diabetes, and lupus.

- Microbiology that is affected by diseases caused by pathogens such as bacteria, viruses, parasites, and fungi. Samples of blood, body fluid and tissue are tested to determine if infection exists, and the medical microbiology field is also busy with identifying new species of microorganisms. Other areas covered by microbiology include controlling outbreaks and finding infection problems resulting from bacterial antibiotic resistance.

#### 7.7.4 Medical specialties

**Medical specialties:** They represent the areas of specialization a doctor wishes to undertake. For example, cardiology, allergology, gynaecology represents specializations that the medical graduate will have to choose for his or her specialized studies and thus become a specialist in a specific medical area. Medicine specializations are divided into three areas<sup>28</sup> : medical, surgical, and clinical services. As an alternative to this path, you can opt for the training diploma in general medicine, for that is, to become a general practitioner .

#### 7.7.5 Pharmacology

**Pharmacology**<sup>29</sup> : science that aims to study drugs and the ways in which the phenomena induced by these substances in the body take place, and as an aim the use of the substances themselves for therapeutic purposes.

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<sup>28</sup><http://magazine.alphatest.it/specializzazione-medicina/>

<sup>29</sup><https://www.treccani.it/vocabolario/farmacologia/>

### 7.7.6 Anatomy

**Anatomy**<sup>30</sup> : biological science that studies the shape and structure of living beings, distinguished, according to whether it has as its object man, animals or pinatas, in human anatomy, comparative anatomy, plant anatomy. Based on the methods and particular purposes of the study, human anatomy is distinguished in:

- systematic or descriptive anatomy, which analytically studies, system by system, the conformation, relationships, structure, and development of the different organs of the body (divided into macroscopic if it limits the observations to the structures visible to the naked eye and microscopic, if it concerns the intimate structure of the various organs, observed with the help of the microscope and other histological techniques)
- topographic anatomy, which studies the organs according to the location they occupy and the reciprocal relationships, dividing the surface of the body into territories and regions.
- surgical anatomy which studies the anatomical problems related to surgical diseases and corresponding interventions.
- pathological anatomy, which has as its object the alterations induced in individual organs by diseases, to confirm a diagnosis or ascertain the cause of death.
- radiographic anatomy that deals with the nomenclature and appearance of the individual parts of the human body as they appear on radiosopic and radiographic examination.
- artistic anatomy, which studies the external forms of the body and of the directly visible organs, especially those of movement, in their proportions and in the modifications connected with the different attitudes or with the moods they express and of which we want to give representation in the art.

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<sup>30</sup><https://www.treccani.it/vocabolario/anatomia/>

### 7.7.7 Therapy

**Therapy**<sup>31</sup> : In medicine , is the study and concrete implementation of what is necessary to lead to healing of diseases by means and methods. It also corresponds to the relative branch of medicine that deals with the treatment of diseases and to the set of methods used for the healing of diseases or wounds and to alleviate their symptoms . Therapy (or cure) is therefore a general concept and applicable to any activity aimed at relieving, reducing, or extinguishing a state of discomfort. E.g., “that hug was therapeutic”. In the strictly health sector, the therapies are generally registered and can be issued by practitioners of a recognized health profession (e.g., doctor, psychologist, biologist, etc.). What distinguishes therapy as a concept from therapy as a health activity is the use of the tools used, tools that the law can reserve for specific professional categories. Therapies are usually classified into:

- drug therapies that involve the administration of drugs
- surgical therapies that involve the use of manual and instrumental techniques for the treatment of pathological conditions.
- Preventive therapies or prophylaxis that involve medical procedures for prevention purposes.
- Supportive or supportive therapies that involve patient support.
- Psychological therapies or psychotherapies that involve the intervention of a psychotherapist (psychologist or doctor) who deals with the treatment of psychopathological disorders.
- Rehabilitation therapies that deal with the prevention, diagnosis and rehabilitation of disability resulting from various congenital or acquired diseases or following surgery. These are mainly diseases that they involve a limitation of activity and restriction of participation in active life, through the reduction of motor, cognitive, emotional, and relational functions.
- Palliative therapy that tends to combat only the symptoms that have become refractory to other clinical treatments. It refers to those treatments aimed at patients affected by a disease

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<sup>31</sup><https://it.wikipedia.org/wiki/Terapia>



whose last evolution, which is no longer avoidable, is death . Palliative care is therefore a specialized clinical approach that aims to improve the quality of life of patients in the last stages of an incurable disease.



## **8. Terminological research**

### **8.1 Introduction**

The theories illustrated in the previous chapters are fundamental to the development of this research work. The purpose of this research is to extract terms connected to the Coronavirus and to create terminological entries in French, English and Italian using the excel model for the TriMED database. The objective is also to underline the importance of conceptual spheres and their direct application in the medical field for the topic of Coronavirus. The conceptual spheres connected to this topic are pathology, epidemiology and prevention and therapy. Before explaining the research process, I had the need to explain that it is important to do a terminological research on COVID-19 terms because they became part of an everyday speech. The work is divided into several phases from finding articles, extracting terms, creating a multilanguage chart containing all the terms and creating the terminological sheets. The last section will be dedicated to the analysis of the terms.

### **8.2 The Coronavirus outbreak**

This terminological research has the aim to show the important role of medical language and terminology nowadays. The COVID-19 pandemic was and still is an exceptional event that has shocked the world and society in the past year. It has offered us a painfully yet concrete example of how the language is directly and quickly invested by social events, and how linguistic changes happens in everyday language. The areas of investigation are mainly focused on lexical changes and innovations; scientific language became accessible to everyone and medical language become a fundamental part of communication. The communication and linguistic methods with which the political institutions have drawn up and sent to citizens the government provisions, the ordinances, and the indications of to follow, the subject of ironic comments and of *meme* on the part of the

Italians, they constitute a field of investigation of great interest and offer significant possibilities for future insights. On the one hand, written documents from decrees to ordinances and various provisions, which have been burdened by a high sectoral writing tradition and on the other, on the level of formal speech, the speeches of the President of the Republic and the Prime Minister. Less formal, and often spontaneous, these speeches are represented by the statements and interventions addressed to citizens by the various ministers involved more directly in the emergency, by the minister of health, the minister of education, the minister of economy and finances, to the minister for regional affairs, to other ministers such as those of the interior, of foreign affairs, of agriculture, who have made their voices heard in particular moments and for specific needs, linked to the emergency. Scientific communication represents another important and complex extension in linguistic and social dynamics. As stated previously medical language is spoken in the common language and terms such as Coronavirus, pandemic or face mask found their usage in our day life speeches. In this period newspapers, television, radio, network, each according to their own communication lines, responded, in the many ways that we will have to investigate, to the stimulating but burdensome task of conveying to the public the scientific contents linked to the birth and spread of the virus. The voices of scientists, epidemiologists, virologists, doctors at the forefront of the treatment of patients with coronaviruses and pulmonologists have been protagonists, directly or in various ways mediated by journalists, in the illustration and explanation of scientific contents. Neologisms appear and anglicism such as cluster or lockdown are frequently used. A big amount of information was released through the internet, media, and television. And alongside, the scientific sectors linked to the virus, the economy, in its various branches, has occupied the pages of newspapers and radio and television broadcasts, as an area whose dynamics are and will be affected by the disaster that the pandemic, he brought with him. Linguists have an important task: to study and document how the population have responded to the extraordinary communication needs that the health emergency has entailed. Lexical technicality in its various declinations from specialism to its dissemination and simplification represents the privileged field of investigation of media communication in the months of the pandemic, and constitutes one of the main areas, together with neologism (to which it is intricately connected) and Anglicism, of lexical change that the Italian language has gone through and is going through in this period. The language also became a part of the public opinion, an object of discussion. People question the

language to better understand and communicate with these new terms and reality. The criticisms from the experts could not be missing, with respect to the simplification and trivialization of contents, compared to the lack of clarity, responsible for increasing the difficulty of understanding for the population.

### **8.3 The terminological research**

This research has the aim to underline neologisms connected to the COVID outbreak and to show the importance that the medical language has in the common language nowadays. I decided to create a terminological research; therefore, the work will be divided into different phases:

#### 8.3.1 Preparatory phase

The first phase or preparatory phases consist in finding two categories of articles: medical specialised articles and non-specialised articles. Both these categories must be on COVID-19 topic from its outbreak to the vaccine studies. These articles about COVID-19 are found in French, English and Italian. I found several researches connected to this field and I also found articles about the vaccine, seen that it is a new fundamental topic. This phase has the aim to define the terminology connected to the Coronavirus which is used on common language and that is part of our speech. The domain is medical domain with a focus on the conceptual sphere of epidemiology of COVID-19.

The specialised articles are taken from health organisations, or government or scientific researches. I found them on PubMed database and Google scholar. The articles are:

- Coronavirus et COVID-19 : le point sur une pandémie galopante. ( Davenne, E. Giot J., Huyen P.)
- Prospects for a safe COVID-19 vaccine (Haynes et al.)
- Les vaccins à ARN anti-COVID-19 ([www.sciencedirect.com](http://www.sciencedirect.com))
- Vaccini anti- COVID-19: lo stato dell'arte (Moschese V.)
- La garanzia di trasparenza e affidabilità (Ferroni E.)
- Modéliser le COVID-19. Défis et perspectives (Diemer A.)

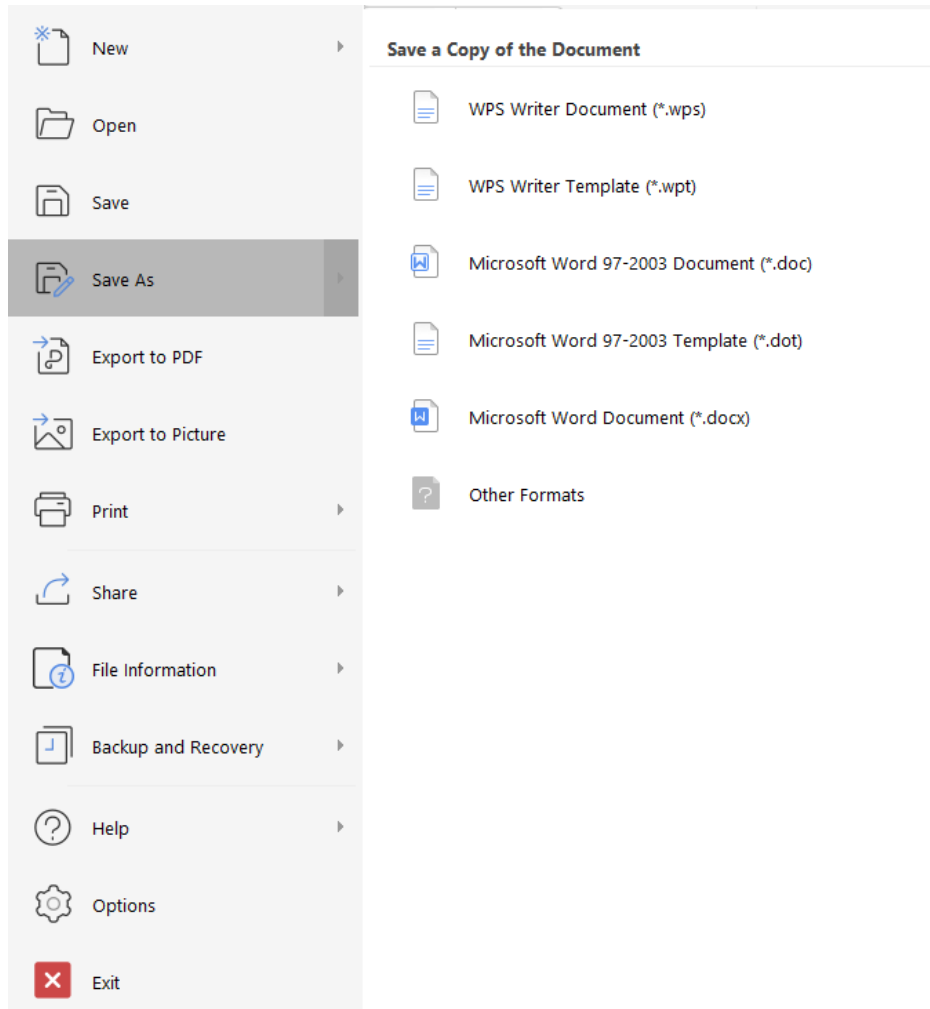
- L’immaginazione sociologica e le conseguenze sociali del Covid-19 (Bonini T.)
- Conoscerlo per sconfiggerlo. Alleanza contro COVID-19 (ENACT)
- COVID-19: Challenges for European Security and selected conflict regions ( Gauster M.)
- Nano pathology of Corona Virus it can be curtailed (Hussain Sheikh S.)
- COVID-19: Ethical dilemmas in human lives (Bustan S., Nacoti M., Fischhoff K.)
- CODIV-19 et détection moléculaire du SARS-CoV-2 chez les individus asymptomatiques (Institut national d’excellence en santé et en services sociaux (INESSS))
- Covid-19. Éléments de littérature scientifique (Centre de documentation de l’Irdes)
- Covid -19: una patologia di una società malata ( Dumontet S., Mamone Capria M.,)
- COVID-19, la malattia da nuovo coronavirus (SARS-CoV-2) (Il ministero della Salute)
- Vademecum della cura delle persone con infezione da SARS-CoV-2 non ospedalizzate. (Federazione regionale degli ordini dei medici chirurghi e degli odontoiatri della regione Lombardia)
- Coronavirus disease (COVID-19) (WHO)
- Mental health and the COVID-19 Pandemic ( Pfefferbaum B., Carol S.)
- Les travaux et les aménagements : ce que la pandémie de COVID-19 a changé pour les français (Institut national d’études démographiques)
- Raccomandazioni ad interim sui disinfettanti nell’attuale emergenza COVID-19: presidi medico chirurgici e biocidi (Istituto Superiore di Sanità)
- COVID-19: immunopathogenesis and Immunotherapeutics ( Yang L., Liu S., Zhang Z., Wan X., Huang B., Chen Y. and Zhang Y.)
- Mise à jour de la stratégie COVID-19 (Organisation mondiale de la Santé)
- The COVID-19 vaccine development landscape (Tung L.)

The media article instead are the following:

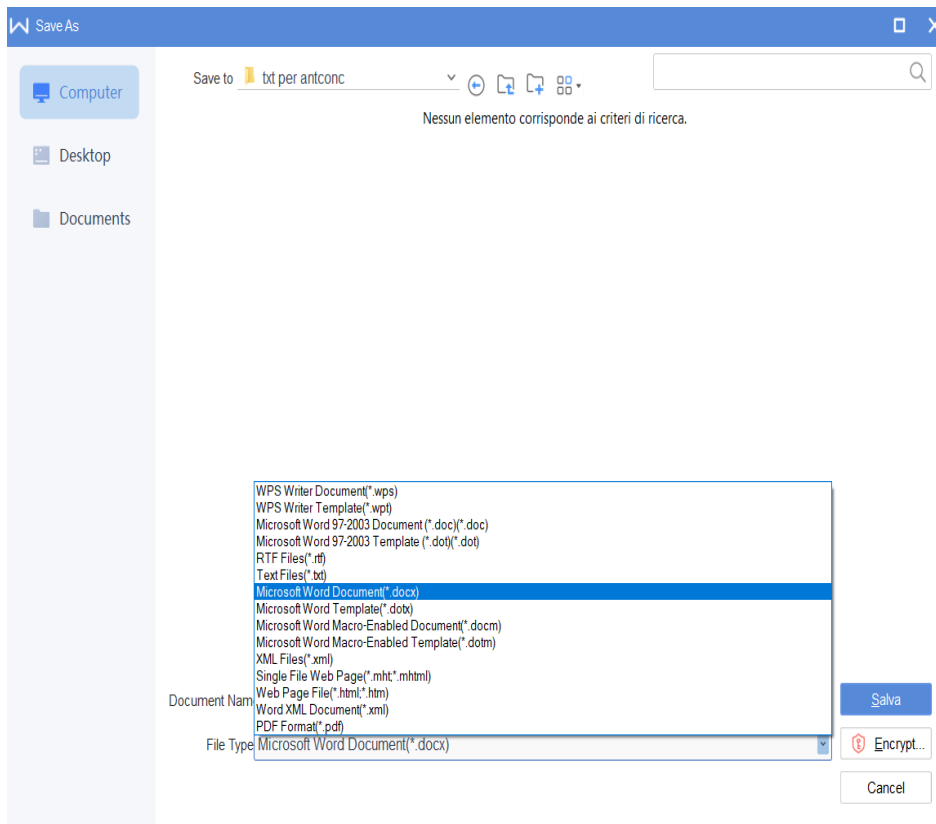
- Covid-19: Vaccine as good as in “real world” as in trial in Israel (BBC News)
- Pandémie de Covid-19 : le virus circulait sans doute en France dès novembre 2019 (Le Monde)
- Covid-19 : le dépistage massif par prélèvement salivaire est désormais possible en France (Le Monde)

- Malgré le couvre-feu, la baisse des déplacements des Français est moins importante qu'espéré (Le Monde)
- What pseudoviruses bring to the Study of SARS-CoV-2 (The Scientist)
- SARS-CoV-2 with Genomic Deletions Escapes an Antibody (The scientist)
- Another potentially immunity-Evading SARS-CoV-2 Variant detected (The Scientist)
- Rischio lockdown totale contro le varianti: le decisioni e gli scenari possibili (Il Giorno)
- Covid 19, la pandemia che ha cambiato il mondo (Il messaggero)
- Coronavirus, la parola alla scienza (Corriere della sera)

Regarding the type of terminology research conducted, it should be remembered that there are two types of terminologies/terminographies, "depending on the use and the situation in which one operates" (Bertaccini, Lecci, 2009:2): systematized/systematic terminology and ad hoc/point-based terminology. The latter is the quickest search because it is done when you encounter a term and want to record it on an electronic or paper medium with the intention of reusing it in the future, the systematic terminology instead has the aim to produce a detailed and exhaustive collection of documents, generally in several languages, concerning a given domain, to clarify concepts and identify equivalents. (Riedieder, 1999). Typically, terminology systematic terminology is based on an onomasiological approach with the construction of flowcharts, trees, and conceptual systems that represent the terms and the semantic relationships between them. The point terminology starts from the term and sign and is based on a textual approach because it starts from the text on which one is working. This project is an ad hoc terminology research has been carried out because the terms have not been extracted from specially created corpora, but from scientific and official texts that were analysed, and the terms extracted according to the interested domain. The specialised articles I found were in pdf format while the media articles in html format. These articles created the corpora from which I extract the terms. Both the format was transformed through the program WPS Office which allow to convert pdf and other file type and save the file in another format according to the usage. I opened the file in WPS Office, and I clicked on the icon "Save as" and followed the instructions to save it in a txt format. Here are the passages that show how to transform a html file into a txt file.







I had to save the file into a txt format because I need this type of file to be read into AntConc. It is a database to extract terms.

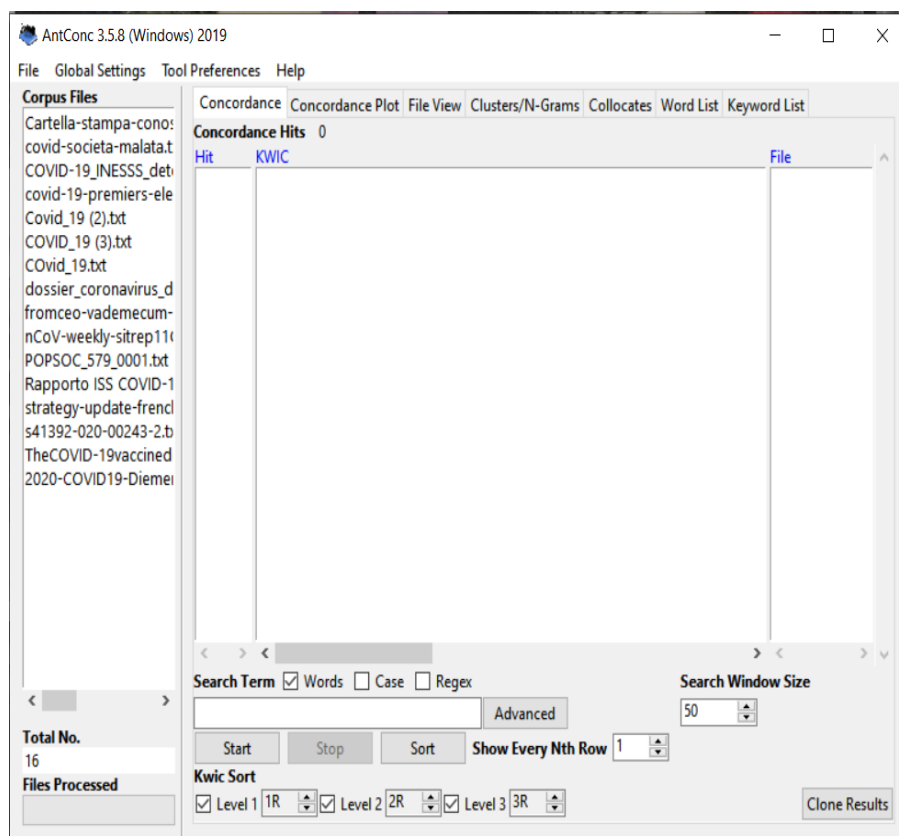


Fig.1

The Fig.1 represents the first step of the term extraction. On the left it presents all the articles found in a txt file.

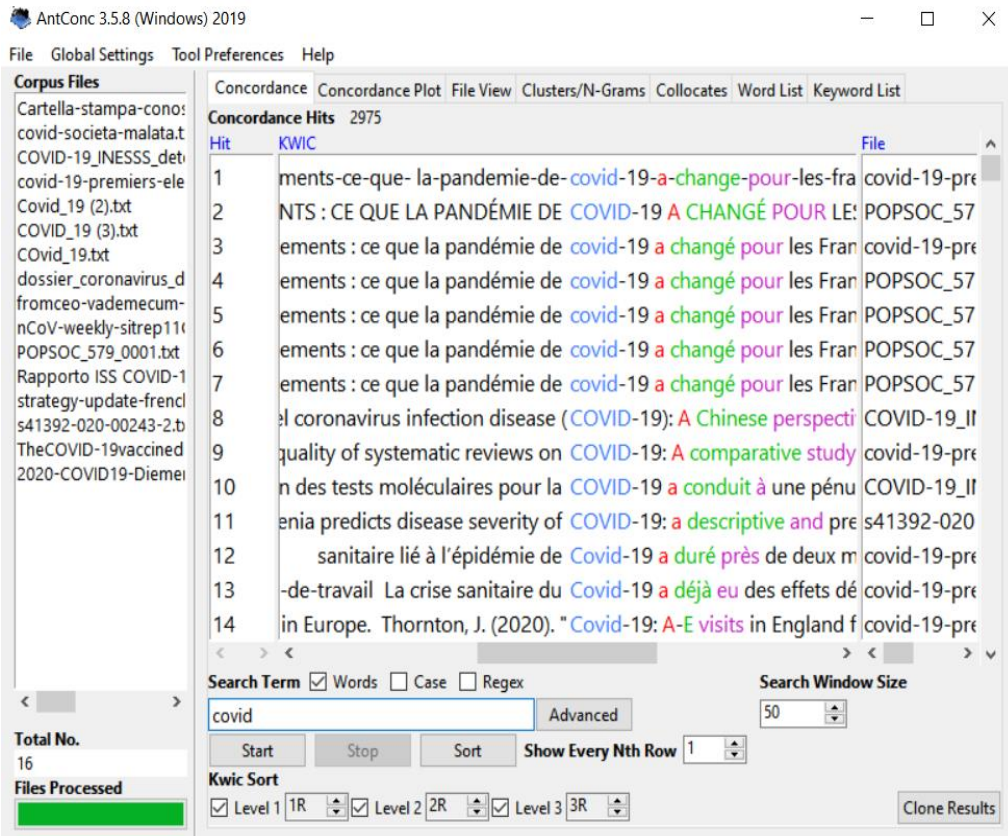


Fig.2

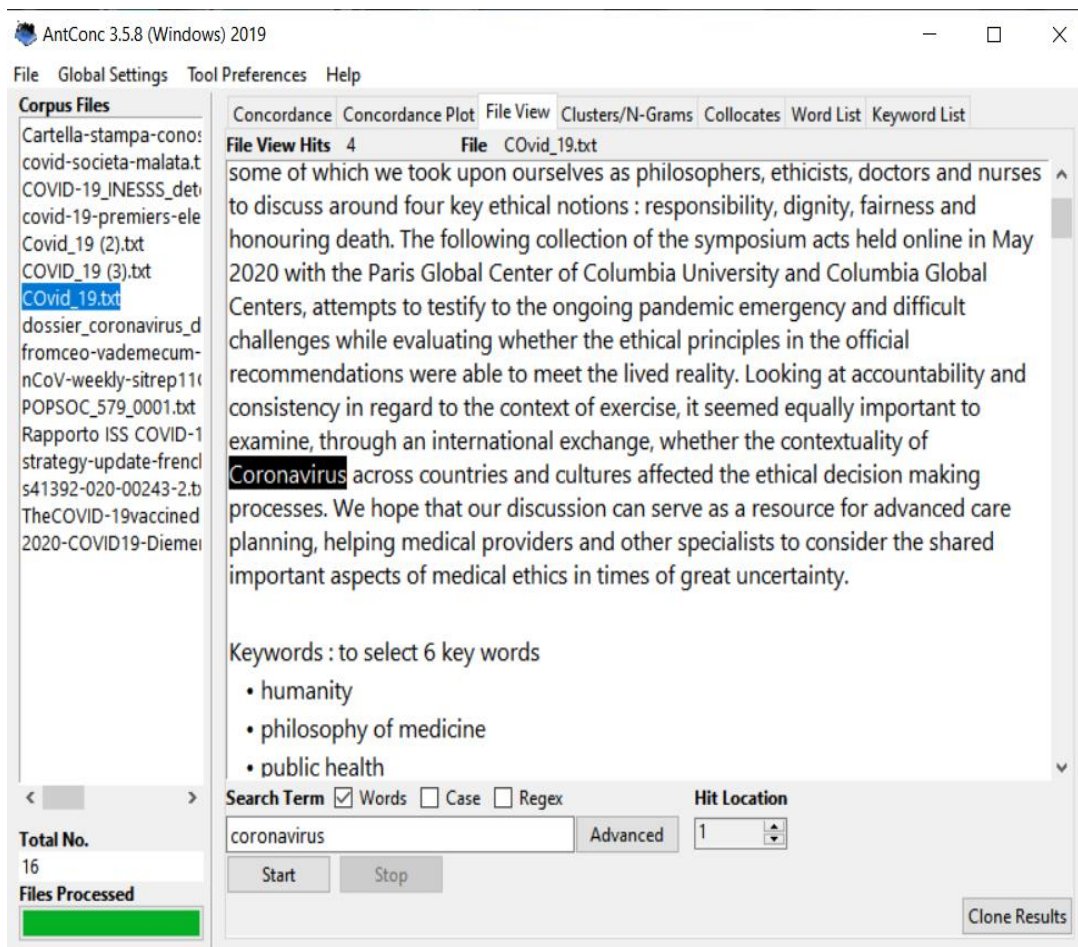


Fig.3

The Fig.2 and 3 show the presentation of the AntConc software. After adding the articles in a form of corpus, the entry “search term” at the bottom of the figure allow to find all the terms referred to the interested domain. In the figure 3 it is possible to see where the interested term appears in the article. I decided to use Coronavirus as domain because it is universally used in all the three study languages. AntConc is a computer software for the detailed analysis of the inserted corpora and the processing of:

- word list, frequency lists that contain all the words of the corpus in order of frequency and that are used to identify the specialized terms of a given domain.

- key word list, words of the corpus that are frequent after a comparison that the program has started with a reference corpus and, for this reason, compared to word lists, the key word lists are even more useful for identifying terms;
- cluster / n-grams, groups of two or more words that are repeated side by side with a minimum and a maximum length and a minimum frequency;
- collocations, placed by a given term;
- concordance, result of the search for a word in the KWIC74 format for which the searched element (node) appears in the center and the portion of text equivalent to the quantity of words or characters specified appears both to its right and to its left, which is sorted alphabetically in to facilitate the search for collocations or phraseologies (Viganò, 2011). This function is useful, as in the case of our terminology search, when you want to search for the context of a term.

I created two parallel corpora one for the specialised articles and the other for media articles. This was helpful in order to better understand and underline the effect of medical terminology in common language.

The preparatory phase also includes all the research work aimed at getting to know the domain of investigation. This part turned out to be fundamental by consulting the articles I found. Another element not to be overlooked are the recipients of the terminology extraction and research. For this project, the target audience was both experts and non-experts. The TriMED terminology portal is aimed at anyone looking for information on a particular term, whether they are a specialist in the field or not. Once the domain and the subdomain had been identified and the terms extracted, I moved to an exhaustive compilation of the term sheet.

### 8.3.2 Executive phase

This phase is the centre of the work. After passing the text into AntConc and having written all the fundamental terms in order of occurrence I analysed which terms were more used and where in common between the two corpora. I elaborated a chart to incorporate all the terms that are the result of the work of terminological extraction. This chart is made in a word format and it was helpful for me to better organise the compilation of the terminological sheet. In this phase I organised the chart in a multilanguage level. For some terms I had to translate them from a

language to another thanks IATE, Collins, Treccani or LeRobert en ligne. during the extraction it happened that some terms like “Coronavirus”, “Covid-19” I did not have to find the respective in the other languages because it is the same translation in all the three languages. In other cases I transcribed directly the respective term into the other language because it appears in the term extraction process, words such as “face masks” “mascherine” and “masque” or “quarantena” , “quarantine” and “quarantine” appears in several texts in all the three languages.

<b>FRANCESE</b>	<b>INGLESE</b>	<b>ITALIANO</b>
Coronavirus	Coronavirus	Coronavirus
Sars	Sars	Sars
Pandémique	Pandemic	Pandemico
Transmission	Transmission	Trasmissione
Confinement	Lockdown	Lockdown
symptômes	Symptoms	Sintomi
Distanciation sociale	Social distancing	Distanziamento sociale
épidémique	Epidemic	Epidemico
Syndrome de détresse respiratoire aiguë	Acute respiratory distress syndrome	Sindrome da distress respiratorio acuto
Maladie pulmonaire	Pulmonary disease	Malattia polmonare
Asymptomatique	Asymptomatic	Asintomatico
Quarantine	Quarantine	Quarantena
Pneumonie	Pneumonia	Polmonite
Vaccin	Vaccine	Vaccino
Télémedicine	Telemedicine	Telemedicina
Désinfection	Disinfection	disinfezione
Hydroxychloroquine	Hydroxychloroquine	Idrossiclorochina
Médecin	Physician	Medico
Masque	Mask ; facemasks	Mascherina

Emergence COVID-19	COVID-19 emergency	Emergenza da COVID-19
Le virus infectieux	Viral infection	Infezione virale
Tomodensitétrie thoracique	Toracic computed tomography	Tomografia computerizzata toracica
Dyspnée	Dyspnea	Dispnea
Équipements de protection individuels	Personal protective equipment	Dispositivi di protezione individuale
Flambées épidémique	Cluster	Focolaio
Prélèvement naso-pharyngé	Nasopharyngeal swab	Tampone nasofaringeo
Test antigène	Antigenic swab	Test antigenico
Mesure de confinement	Containment measures	Misure di contenimento
Pic d'infection	Infection peak	Picco d'infettività
Regroupement	Gathering	Assembramento
Protéine de nucléocapside	Nucleocapsid protein	Proteina del nucleocapside
Anticorps	Antibodies	Anticorpi
Réaction au vaccin	Vaccine reaction	Reazione al vaccino
VAED	VAED	VAED
Adénovirus	Adenovirus	Adenovirus

After having completed all the box with the more occurrent terms and having translated those who did not occur in all the articles; these terms were reported into terminological sheets. The terminology cards were compiled on Microsoft Excel with a particular setting used for the TriMED database. Here is an example of the terminology sheet compilation. The compilation of the TriMED files was the most important part of the research. These terms extraction and terminology work led to two research connected between them. As previously analysed in the theoretical part it is

important to underline the conceptual spheres in medical language. In this case the main field is mostly pathology and this research has the aim to show how label between conceptual spheres sometimes are not delimited. In this case a specific field is becoming part of common language and specific terms are used daily.

Terme	Définition
Coronavirus	Le coronavirus-COVID-19 est un virus très contagieux apparu en Chine fin décembre 2019, à Wuhan. Il présente des symptômes similaires à ceux de la grippe (fièvre, maux de tête, courbatures, fatigue, toux sèche et essoufflements, difficultés respiratoires), mais il peut aussi provoquer une forme de pneumonie.

Fig.1

Référence croisée externe (définition)	Source (définition)	Note (définition)	Analyse sémiologique
<a href="https://enfrancais.loescher.it/quelques-infos-sur-le-coronavirus.n8305">https://enfrancais.loescher.it/quelques-infos-sur-le-coronavirus.n8305</a>			virus, contagieux, grippe, toux sèche, difficulté respiratoires, pneumonie.

Fig.2



Partie du discours	Genre grammatical	Nombre grammatical	Prononciation
nom	M	singulier	ko.ʁo.na.vi.ʁys

Fig.3

Étymologie	Variante orthographe	Acronyme	Expansion	Abréviation
du latin corona et de virus		COVID-19, COVID, SARS-Cov-2		

Fig.4

Formes dérivées	Collocation	Unité phraséologique	Synonyme
			SARS-CoV-2, Covid 19, Covid

Fig.5

Hyperonyme	Hyponyme	Contexte
		Coronavirus : chiffres clés et évolution de la COVID-19 en France et dans le Monde
virus		

Fig.6

Référence croisée externe (con)	Source (contexte)	Registre	Nom commun	Nom scientifique
<a href="https://www.cnrtl.fr/definition/pand%C3%A9mique">https://www.cnrtl.fr/definition/pand%C3%A9mique</a>			COVID; COVID-19	SARS-Cov-2
		spécialisé		

Fig.7

Figures from 1 to 7 represent the organisation and structure of a terminological chart. It is an excel format and it is not possible therefore to represent in a word format but by doing a series of screenshots. In this case the word analysed is “Coronavirus” and the language of analysis is French. This work is done for all the words of the chart in paragraph 8.3.2.

The terminological field completed for this research are available at the following link:

**<https://www.dropbox.com/scl/fi/60prlo7vjgemavyh5dh93/schede-terminologique-Covid.xlsx?dl=0&rlkey=925fx5hims2uqa8nddhk5mn4e>**

#### 8.4 Terminological research results

Starting from some cases of meaningful words like for example *coronavirus* which is not a recent scientific neologism; it exists in Italian since 1970 and was already the subject of numerous studies along with its acronyms *COVID-19* and *SARS-CoV-2*. However, according to Dr. Daniela Pietrini (2020) in her article written for the encyclopaedia Treccani, shows how this form Coronavirus is not a word formation that characterises Romance languages. For example, if we consider the Italian terms “virus HIV” or “virus Ebola” it is possible to understand the word formation of the Romance languages which form that have the term virus at the beginning. Coronavirus on the other hand is an anglicism with a Latin base; it is formed by the term “corona” which means have a crown, and virus. From the head “corona” of coronavirus some neologisms have formed, more relevant such as *coronabond*, or *emergency coronavirus*, *coronavirus economy*.

For example, recurrent medical techniques such as *dyspnea*, *pulmonary disease* or *acute respiratory distress syndrome* became known and transparent.

*Doctor* in English is a title that is granted not only to doctors but also to any holder of a Ph.D. in the medical field is more used the word *physician*. In Italian it is the same even if it is more common to use the word *dottore* in the medical field. In French, only *medicins* are entitled to the title of *docteur*, others take Monsieur, Madame or Mademoiselle before the name, and the mention of their diploma at the end.

Another interesting term is *télémedicine- telemedicine- telemedicina*. It is a neologism created in this moment. It refers to the distribution of health-related services through the support of telecommunication technologies.

In the field of non-technical-sectorial neologism, several lines of investigation deserve attention. Among the neologisms, we can mention *paziente zero* (from eng. *patient zero*), *digital surveillance*, *epidemic curve*, *phase two / 2 is phase three / 3*, and many others, registered as neologisms (several with the 2020 date) on the Treccani Vocabulary and, some, treated in detail on the Accademia della Crusca website in the section *New words*.

In the semantic field of distance, the productivity of the prefix is evident *tele-* and *video-*, we have witnessed the extraordinary diffusion of pre-existing words and expressions, such as *video call*, *videoconference*, *video concert*, *video aperitif*. Another important suffix is *web-*, on which, a few years ago, the voice was formed in this quite common period *webinar* (*web* + *seminar*).

The diffusion, and often the revivification of pre-existing words, was in fact incredibly significant in this period, investing, as well as first of all, words related to the concept of distance, also other words, more or less common, such as *quarantena*, used beyond its semantic boundaries.

Among the neologisms, many are occasionalisms, destined to fall out of use, a fate certainly reserved for the joking neologisms born in this period, in the context of that tendency towards irony and joke that has been detected in the period of the pandemic, and of which we have all seen the signs in cartoons, *meme*, videos, which are shot on the various social channels.

Another interesting direction in the field of lexical change and semantic neology is that of ambiguity and shifts, which have invested some words. The term *positive* with reference to serological tests aimed at ascertaining the presence of antibodies; positive is, for many, the result of those who have developed antibodies that perhaps make them immune to virus for having already had it, while for the swab, as for other tests, the word is meant as indicating the presence of a pathology. In this case the word that has been connotated to good news, nowadays acquires the opposite meaning. A quite different case is represented by *viral* which has fully regained the proper meaning relative to the virus instead of the meaning connected to the social networks.

But the aspect of the lexical change that took place in this period on which the speeches of linguists, and of journalists were most concentrated, was the entry of numerous Anglo-Americanisms, starting with the words that most invaded everyday speech such as *lockdown*, *smartworking* or *smart working*, however, false Anglicism, given that the Anglo-American uses *remote work* or *working from home*.

For both Italian alternatives have been proposed: for *lockdown*, the original meaning of which is “confinement of prisoners in their cells”, the corresponding used are *confinamento* suggested by Crusca, *chiusura*, *clausura*, *blindatura*, *blocco di emergenza/totale* , *isoalmento* up to the imprecise and inappropriate *serrata* and *coprifuoco* . They seem perhaps have been more successful alternatives to replace *smart working* which was much discussed also for the ambiguous meaning of *smart* as capable, intelligent, brilliant, refined to pre-existing ones *lavoro a distanza*, *da remote e telelavoro* , the correspondence proposed a few years ago by Crusca was added *lavoro agile* , which in certain areas and perhaps with an increase over time it seems to have had a good response, even if it raised some criticisms, because it introduced a new term that did not completely overlap and rather entered into conflict, in the labor legislation, with *telelavoro* .

Less common *drop* is *droplet*, used in scientific writing and partly in journalistic writing, but very little in the common language, where we speak of *goccioline*, or *goccioline di saliva* or *g. respiratorie*. The prevalence of the Italian word (*goccioline*) on Anglicism we must probably also to the uniqueness of the Italian equivalent, while in cases in which more Italian equivalents correspond to Anglicism, such as eg. *lockdown* is the first to prevail.

If we consider the terms in a generic vision it is possible to notice that more the term is specific and more the equivalence in another language is similar and unique. Terms such as hydrochloroquine, or coronavirus or acute respiratory distress syndrome or dyspnea are highly specific ones and their translation is nonreferential. This is an important aspect, and it helps the spread of a clear communication between protectionists of the field but also between people in general. French language tries to convert neologism, to find an equivalence in his vocabulary while the Italian sometimes allows English neologism in his vocabulary. For example, as I shown before the term lockdown was used later; Italy was the first nation to enter in a lockdown, at the beginning the term we referred to was *quarantena* or *zona rossa*, *chiusura totale*. Later, when England and the united states of America entered in lockdown this term appear and was spread in other languages such as Italian.

### **8.5 Semantic research results**

Definition, as taught by Chaïm Perelman and Lucie Olbrechts-Tyteca's "Treatise on Argumentation", promotes the recognition of identity based on the relationship that exists between *definiendum* and *definiens*.

Perelman establishes the argumentative character of the definition in the multiple perception of the same object and therefore in the need to discuss its nature by suggesting etymological meanings, and normative, descriptive, and rhetorical declinations. The name often conceals the definition. Especially if this name is assigned by scientists. Co.vi. d.19 transliterates as Corona virus disease 2019 but then reads severe pneumonia, i.e., fatal. A metonymy therefore of effect for cause. The acronym is a definition condensed into brevity, reticence and allusiveness that sends those unfamiliar with the medical-scientific language to translation and then to paraphrase, and finally to abbreviation. The result is that Covid-19 is called a coronavirus by most. The current pandemic therefore has many different forms, and none of them is neutral.

In general communication it is known as corona virus, in hospitals it is mostly severe pneumonia, in journalism it is covid-19, among virologists it is covid 2 Sars. The very nomenclature of the virus conceals and reveals the degree of danger to the global community, although it is curiously less frequent. This observation must be made not only because, according to the dissociation argument, covid 2 Sars is the virus while covid-19 is the disease, but because Sars calls into question an extremely specific disease with a very alarming memory, which manifested itself in 2003 in the form of deadly pneumonia. The etymology of the name of a virus or disease places us within the rhetoric of naming.

#### 8.5.1 New technolect of COVID-19 and semantic implication

It is known that etymological definition is sometimes an attempt to shift the interpretation of the characteristics of an object in the direction that best suits our thesis.

The technolect evolution in relation to the Covid-19 pandemic is marked using phrasal constructions that reflect the exceptional nature of the current situation. Every sociolinguistic community defines itself in a general way through the different uses it makes of its linguistic varieties. The current health crisis has given rise to technolect units that can easily be identified in the everyday use of speakers. Thus, words such as corona, COVID-19, mask, etc. are being increasingly propagated in oral, written, current, scholarly, etc. uses and are giving rise to a new technolect which certainly has an impact on the linguistic exchanges of individuals, which it would be wise to study in order to accompany the impact of the current universal health situation on local linguistic creativity.

Thus, it would be interesting to note, through the corpus and the terminological research led in this work, which are the vital areas at the origin of the emergence of the Covid-19 technolects in the French, English and Italian specialised and non-specialised medical language. I will limit this analysis to the semantic spheres mentioned in the previous chapter.

As a result, the Covid-19 technolect emanates from various specific fields; the most solicited of them are mainly: health, medicine, and law. Through the data of the corpus, I have identified specific themes for each field which we will present in tables for illustration purposes.

Health and medicine occupy the main part of the domains in the corpus.

Four main themes seem to belong to this field: epidemiology, collective hygiene, health policy and health statistics. Technolect units relating to each theme will be listed; they could be used to draw up a typology of the fields of Covid-19 technolect. Thus, the following tables will present the fields concerned by Covid-19 with their thematic distribution.

<b>Health</b>
<p><b>Epidemiology</b></p> <ul style="list-style-type: none"> <li>- Coronavirus</li> <li>- Covid-19</li> <li>- Sars</li> <li>- pandemic</li> <li>- Spread of the virus</li> <li>- Virus</li> <li>- Sanitary isolation</li> </ul>
<p><b>Collective hygiene</b></p> <ul style="list-style-type: none"> <li>- Alcohol</li> <li>- Hydroalcoholic gel</li> <li>- Protective mask</li> <li>- Face mask</li> </ul>
<p><b>Health policy</b></p> <ul style="list-style-type: none"> <li>- Sanitary measures</li> <li>- Quarantine</li> <li>- Social distancing</li> <li>- Lockdown</li> </ul>

To be more specific and focus the attention on the medical language in strictu sensu it is possible to divide the term according to the following scheme:

<b>Conceptual sphere TriMED</b>
<b>Pathology</b> <ul style="list-style-type: none"> <li>- Infection</li> <li>- Covid-19 infection</li> <li>- Transmission</li> <li>- Symptoms</li> <li>- Acute respiratory distress syndrome</li> <li>- Pulmonary disease</li> <li>- Asymptomatic</li> <li>- Pneumonia</li> <li>- Viral infection</li> <li>- Dyspnoea</li> </ul>
<b>Pharmacology</b> <ul style="list-style-type: none"> <li>- Chloroquine</li> <li>- Hydroxychloroquine</li> <li>- vaccine</li> </ul>
<b>Prevention</b> <ul style="list-style-type: none"> <li>- Nasopharyngeal swab</li> <li>- Antigenic swab</li> <li>- Personal protective equipment</li> <li>- Face mask</li> <li>- Mask</li> <li>- Personal protective equipment</li> <li>- Thoracic computed tomography</li> </ul>

According to this analysis it is evident that the COVID-19 terminology, however it is specific it become part of the language. In medical language it is inserted in the conceptual spheres before presented and can be classified into the TriMED database.



## 9. Conclusions

The aim of this thesis was to illustrate the terminology research project carried out during the COVID-19 emergency period. Terminology was found in the publications from all over the world, and extracted within the chosen domain of Coronavirus and, subsequently, terminological sheets in French, English and Italian were completed in Excel form. Once the compilation and revision phase were completed, the terminological entries were analysed to understand the differences or the similarities in this field. The thesis is divided into six chapters of which the first four have provided us with the basic theoretical knowledge to fully understand the terminological activity and, in this case, research in the field of medical language. After a general overview on the difference between a special language and the common language I focused the attention on underline the characteristics of a special language. In this case it is possible to affirm that medical language can be a special language. The next chapter explain the role of terminology and his path from the beginning to its growth, also thanks to the terminology revolution. It is important to show the characteristic of terminology and the importance of the role of the terminologist. The chapter four contains the features of corpora, with a particular focus on the role that corpora have in linguistic and mostly on computational linguistic. To conclude this theoretical section the following chapter has the focus on the terminology database called TriMEd and on the characteristics of terminological sheet. This path allowed me to introduce the terminological research carried out and to describe it in detail in the sixth chapter everything that has been produced. From a methodological point of view, the project carried out was stimulating it allowed the knowledge acquired during study to be put into practice in an actual domain that posed interesting challenges at a terminological level, both for the search and for complete and precise definitions and for the identification of equivalents in French, English and Italian during the process of terminology extraction. This involved meticulous and accurate work, essential for a precise terminology, which highlighted the importance of the role of the terminographer / terminologist, for the representation and transfer of terminological knowledge, and of the use of technology in the terminology field, not only in general, but also in the domain of medicine. However, the terminological research carried out so far cannot be defined as finished. Given the

continuous evolution of the chosen domain, its complexity and the nature of the terminology itself, this project intends to be a starting point for future changes and revisions to be carried out constantly. In fact, it is important that the terminology cards are periodically examined, and their content corrected, if necessary, by adding or replacing more recent or complete information or, again, eliminating them if obsolete or incorrect, in order to provide users with a terminological database which is coherent, comprehensive and always up to date. These terms extraction and terminology work led to two research connected between them. As previously analysed in the theoretical part it is important to underline the conceptual spheres in medical language. In this case the main field is mostly pathology and this research has the aim to show how label between conceptual spheres sometimes are not delimited. In this case a specific field is becoming part of common language and specific terms are used daily.

This research demonstrates and analyses the importance of terminological database for medical field. Specific language in one had led to specific and unique translation but on the other hand sometimes contaminations occur between languages and a term is shared and adopted in both languages or other times neologism are created. In this last case it is important also to take into consideration the conceptual spheres because neologism must fit in one sphere. For example, the new term “telemedicina” which is adopted to all the three languages and used commonly has to be inserted into a conceptual sphere which is not the pathology but on medical specialities; it will create a new entry for this term in English, French and Italian.

## **Ringraziamenti**

Desidero ringraziare il docente Dott. Giorgio Maria Di Nunzio per avermi seguito con dedizione in questo percorso di tesi. Ringrazio anche la dottoressa Federica Vezzani per il materiale e l'aiuto dimostrato.

Ringrazio i miei genitori che sono stati il mio supporto in questi anni, devo a loro la mia crescita come persona e come professionista. Ringrazio mio fratello Nicola e la sua ragazza Valeria per essermi sempre stati accanto nonostante le distanze. Ringrazio mio zio e l'affetto che mi dimostra ogni giorno nonostante tutto. Ringrazio Riccardo per essermi sempre stato accanto. Ringrazio i miei amici da una vita Livia, Veronica, Edoardo, Tommaso, Giulia e Valentina per esserci sempre stati gli uni per gli altri. Ringrazio Valeria e Arianna che mi sono sempre state accanto e che sono state la mia sicurezza in un posto nuovo come era Padova. Ringrazio Margherita per tutto l'affetto dimostratomi ogni giorno e per tutte le chiacchierate e i ricordi insieme. Ringrazio infine la mia coinquilina Ludovica per il supporto e i bei momenti insieme e tutte le ragazze dell'ONAOSI che in questi due anni sono state la mia seconda famiglia.



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