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FRAMES FEATURING IN EPIDEMIOLOGICAL CRISIS COMMUNICATION
A Frame-Semantic Analysis of Pandemic Crisis Communication in Multilingual Belgium

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Abstract – To date, frame-semantic theory has been applied to various domain-specific discourses, such as legal, economic, and even oenological discourses. Yet, epidemiological crisis communications form a domain-specific discourse tradition which has been left untouched by frame-semanticists. As such, we will conduct a descriptive pilot study which will consider some of the frames present in these texts. To this end, we collected a pilot corpus of Dutch COVID-19-related crisis communications from the Belgian government, which according to previous research (Liégeois, Mathysen 2022) can, in fact, be regarded as epidemiological crisis communications. More concretely, we considered the frames in which five terms – *virus*, *coronavirus*, *COVID-19*, *epidemie* and *pandemie* – inherent to this domain could occur and investigated the following three research questions: In which frames do our five target terms resurface within this domain-specific discourse tradition (RQ1)? Which functions do these frames fulfil within this domain-specific discourse tradition and can other domain-specific features (e.g., regarding the FEs of these frames) be found (RQ2)? Can these frames and their functions be linked back to the communicative strategies singled out by previous research on these Belgian epidemiological crisis communications (RQ3)?

Keywords: COVID-19 health pandemic; frame semantics; domain-specific discourse; health discourse; crisis communication.

1. Introduction

Health communication plays a central role in the COVID-19 pandemic. A big part of this includes communication about the virus responsible for the pandemic (SARS-CoV-2), the disease (COVID-19), and epidemiological data on the evolution of the pandemic. Linguists have already spent a great deal of attention on the lexicological representation of such COVID-19-related terminology, discussing (i) the lexical units used to denote the virus (e.g., *SARS-CoV-2, coronavirus*) and its subsequent disease (e.g., *COVID-19, corona*) (cf. Brylla 2020, p. 175), (ii) the possibly unwanted connotations

exhibited by this terminology, like the connotation of "danger" of *SARS-CoV-2* (cf. Brylla 2020; Hu *et al.* 2020) and the expressive collocation of *deadly (corona)virus* (Ramos *et al.* 2020, pp. 643-645), and (iii), whether the used terminology led to the discrimination of certain population groups, like how the collocations of *Chinese virus*, *China Virus* and *Wuhan Virus* caused the discrimination of people of Asian descent living outside of China (cf. Craig 2020; Hu *et al.* 2020; Masters-Waage *et al.* 2020; Ramos *et al.* 2020). Less attention, however, has been given to their discursive representation, i.e., the way in which these terms are embedded in their intratextual context, that is, with respect to the sentence to which they belong and their neighbouring sentences (cf. Meibauer 2012, p. 11).

A theoretical framework which is particularly interested in such discursive features is the cognitive semantic theory of frame-semantics. Within this research paradigm – which is explained in more depth in Section 2 – linguists seek to distinguish the different frames relevant to human life. These frames regard "collections of knowledge about characteristic features, attributes and functions of a denotatum, and its characteristic interactions with things typically associated with it" (Alan 2001, p. 251). Elements included in the MEDICAL_CONDITIONS-FRAME are, for instance, AILMENT, PATIENT, BODY_PART, CAUSE and DEGREE (BFN- Frame Index: MEDICAL_CONDITIONS).

Many frame-semanticists have also taken a great interest in the study of domain-specific discourse. Within this research paradigm, we find that frame semantics (i) provides a cognitively oriented framework to account for domain-specific language features and (ii) is able to deliver insights which could not have been reached by more traditional terminology frameworks.

Our own analysis is based on this research tradition as well. More particularly, we looked at COVID-19-related terminology – five target terms: *virus*, *coronavirus*, *COVID-19*, *pandemie* and *epidemie* – in a pilot corpus of Dutch public service communications in Belgium (cf. Section 3). Previous research by Liégeois and Mathysen (2022) showed that these texts could be regarded as "epidemiological crisis communications" (subdomain of health discourse), since most of the texts were epidemiological reports (cf. Section 3). Additionally, even those crisis communications which did not exactly fit the label of epidemiological report still offered various kinds of epidemiological information and included terminology inherent to this domain. With our current paper, we thus delve into a domain-specific discourse tradition which has not been studied by frame-semantic scholars yet. Our research questions are the following:

RQ1 In which frames do our five target terms resurface within this domain-specific discourse tradition?

RQ2 Which functions do these frames fulfil within this domain-specific discourse tradition and can other domain-specific features (e.g., regarding the FEs of these frames) be found?

RQ3 Can these frames and their functions be linked back to the communicative strategies singled out in previous research on Belgian epidemiological crisis communication (Liégeois, Mathysen 2022)?

Assuming that the five target terms considered here are closely linked to the ontology of the domain, it is expected that (i) we will indeed encounter domain-specific features and (ii) find frames which are highly relevant for this domain-specific discourse tradition. By considering the aforementioned research questions we therefore hope to provide some first frame-semantic insights into the workings of this domain-specific discourse tradition. Moreover, we hope that the results of our inquiry can be a point of reference for other frame-semantic inquiries into closely related discourse traditions or even other forms of COVID-19-related crisis communications in different countries and languages.

Our paper is structured as follows: Section 2 will introduce the cognitive framework of frame semantics (Subsection 2.1), discuss the application of frame semantics into the study of domain-specific discourses (Subsection 2.2) and establish a distinction between frames as a conceptual and as a discursive notion (Subsection 2.3). Section 3 entails the discussion of our corpus of public service communications and will, in light of RQ2 and RQ3, pay particular attention to the qualitative discussion of the corpus, i.e., specifying the type of texts included in the corpus, as well as their text functions. This qualitative discussion will draw from the previous study by Liégeois and Mathysen (2022). Section 4 elaborates on the procedure of our inquiry, i.e., the way in which we analysed our data. The results of said analysis are, in turn, discussed in Section 5. More specifically, we will provide a first quantitative overview of the different frames distinguished by our analysis (Subsection 5.1), discuss the different frames and their possible domain-specific features from a more qualitative perspective (Subsection 5.2), and establish a comparative overview regarding the domain-specific aspects of these frames (Subsection 5.3). A summary and notes for future research are formulated in Section 6.

2. Frame semantics

2.1. Theory

Frame semantics is a form of cognitive semantics developed by Charles J. Fillmore (1976; 1977). As such, it is a linguistic theory which tries to explain how humans can process (memorise, understand, use, …) all meaningful

units necessary to human life (for an overview, see also Boas, Dux 2017 and Ziem 2014). More concretely, Fillmore connects semantics to encyclopaedic knowledge, stating that "meanings are relativized to schemes" (Fillmore 1976, p. 59).

According to this view, in order to comprehend the meaning of a single word – or any other type of lexical unit –, one needs to understand all essential knowledge regarding said lexical unit. This "essential knowledge", in turn, constitutes a frame. This is a cognitive schema internalised by the speaker which is activated whenever he/she finds him-/herself in a scene related to the frame and thus needs to understand or produce discourse related to it (Petruck 2013, p. 1; Ziem 2014, p. 88). The constituting elements of the frame are called frame elements (FEs). One of these frame elements is the frame-evoking element (FEE), which is the FE at the heart of the frame that evokes all other FEs (Ziem 2014, p. 198). The different words and collocations which can serve as FEs are called lexical units (LUs). A further distinction can also be made between CORE FEs and NON-CORE FEs (cf. L'Homme 2015, p. 30; 2016, p. 4).

The most famous example in this regard, formulated by Fillmore at the very beginning of frame-semantic theory (1976, p. 25), is the COMMERCE_BUY-frame. As humans, we frequently find ourselves in commercial scenes, either as a buyer or seller. In this instance, the COMMERCE_BUY-frame is the cognitive schema relevant to such a commercial scene from the perspective of the buyer. It is defined as follows by the Berkeley Frame: "a basic commercial transaction involving a BUYER and a SELLER exchanging MONEY and GOODS, taking the perspective of the BUYER" (Berkeley FrameNet: Frame Index: COMMERCE_BUY). The relevant FEs within this frame are BUYER (FEE), SELLER, MONEY and GOODS – see also the examples in (1):

(1) a. Eng.: Abby$_{\text{BUYER}}$ bought a car$_{\text{GOODS}}$ from Robin$_{\text{SELLER}}$ for $5,000$_{\text{MONEY}}$.
b. Eng.: Only one winner$_{\text{BUYER}}$ purchased the paintings$_{\text{GOODS}}$.
c. Most of my audio equipment$_{\text{GOODS}}$, I$_{\text{BUYER}}$ purchased from a department store near my apartment$_{\text{SELLER}}$.
(BFN – Frame Index: COMMERCE_BUY)

The COMMERCE_BUY-frame manifests itself in each of the above sentences. The FEE, BUYER, is occupied by *Abby* (1a), *one winner* (1b) and *I* (1c). The other evoked FEs include GOODS ((1a) *a car*, (1b) *the paintings*, (1c) *Most of my audio equipment*), SELLER ((1a) *from Robin*, (1c) *from a department store near my apartment*) and MONEY ((1a) *for $5,000*).

Frame semantics has come a long way since the original seminal papers written by Fillmore (1976, 1977) (for an historical overview, see Boas, Dux 2017), proving its relevance for many issues lying outside the

domain of semantics and lexicology, like morphology and syntax (Ziem 2014: XI). The most important advance in the frame-semantic field remains perhaps the lexicographic Berkeley FrameNet-project[1] (hence BFN) from the International Computer Science Institute (Petruck 2013, p. 2), which aims to index the frames and lexical units inherent to the English language and to be a useful point of reference for frame-semantic inquiries, including those into other languages.

Due to reasons of space, we will not be able to discuss the evolution of various research traditions within frame-semantics in more depth and instead focus on frame-semantic inquiries into domain-specific discourses (Subsection 2.2).

2.2. Frame semantics and domain-specific discourse

Frame-semantics has proven to be a particular useful instrument for the study of domain-specific discourse (cf. Bernier-Colborne, L'Homme 2015; Dolbey 2009; Dolbey *et al.* 2006; Faber *et al.* 2006; L'Homme *et al.* 2014; Verdaguer 2020, p. 131). Discourses considered by frame-semanticists include, among other, legal discourses (cf. Venturi 2013; Wulf 2018), economic discourses (cf. Scholz, Ziem 2013; Ziem 2014), environmental discourses (cf. L'Homme 2016; 2018; 2021; L'Homme *et al.* 2018; 2020; Varga 2019) and even oenological discourses (cf. Bach 2021). Frame-semanticists have, in this regard, also looked at the translations of domain-specific discourse (cf. Czulo 2017; Szymańska 2011) and even sought to establish domain-specific framenets, as was done by L'Homme for the environment (the DiCoEnviro-project[2]).

Such domain-specific studies have also looked at health discourse (cf. e.g., Dessì *et al.* 2019; Estévez, Llácer 2005; Haddad, Martinez 2020; Verdaguer 2020; Wandji 2014; Wandji *et al.* 2013; Wermuth 2008). A recurrent research topic, in this regard, concerns the analysis of verbs used in medical texts (cf. Estévez, Llácer 2005; Verdaguer 2020; Wandji 2014; Wandji *et al.* 2013). Frame semanticists attribute a great deal of importance to verbs, since these grammatical categories often function as the FEE of a sentence. This is also exemplified by the great number of verbs present in BFN's Lexical Unit Index and the many frame-semantic methodologies

[1] BFN – Berkley FrameNet. https://framenet.icsi.berkeley.edu/fndrupal/ (last accessed: January 30, 2022); In the wake of this project, lexicographic frame-oriented projects for many other languages – e.g., German (FND – FrameNet des Deutschen), Japanese (Japanese FrameNet – An online Japanese lexicon based on Frame Semantics) and Spanish (SFN – Spanish FrameNet) – have emerged as well.

[2] DiCoEnviro – Le dictionnaire fundamental de l'environnement. http://olst.ling.umontreal.ca/cgi-bin/dicoenviro/search_enviro.cgi (last accessed: January 30, 2022).

starting from the verbal field.[3] Yet, within terminological research, verbs are often overlooked in favour of the nominal field. This is in part due to the fact that such verbs are seldomly domain-exclusive, appearing across different domain-specific discourses. This type of research can be exemplified by Verdaguer's (2020) study of verbs with similar syntactic and semantic behaviour in English medical texts, in which she considers six verbs: *address*, *concern*, *deal*, *discuss*, *refer* and *treat*. These verbs indeed are not domain-exclusive, since they also appear in other (non-health-related) domains. However, with the help of frame-semantic theory and data provided by the BFN, Verdaguer was able to assign (domain-)specific syntactic and semantic features to these verbs and determine that the verb *treat* is particularly polysemous (Verdaguer 2020, p. 142-146). It was even found to evoke seven frames: CURE, TOPIC, GIVING, PROCESSING_MATERIALS, COMMUNICATE_CATEGORIZATION, MEDICAL_INTERVENTION and TREATING_AND_MISTREATING (Verdaguer 2020, p. 142).

Frame-semantic inquiries into health discourse are, of course, not limited to lexicological studies in the verbal field and comprise, among other, also contrastive studies (cf. Wandji *et al.* 2013) and combinatory approaches with computational linguistics (cf. Dessì *et al*. 2019). Additionally, they have also considered a wide variety of medical/health-related texts, like medical rubrics (cf. Wermuth 2007) and obesity epidemic discourse (cf. Stroebel *et al.* 2016).

Regarding the COVID-19 health pandemic, the Terminology Coordination Unit of the European Parliament, in April 2020, has published a *frame-based* terminological schema. It included the COVID-19-related terminology relevant to the development of the disease and (cf. figure 1) aimed to be a simple way of graphically structuring the available information about the disease, including, among other, symptoms, preventive measures and possible complications (cf. Haddad, Martinez 2020).

[3] See, for instance, our own methodology in Section 4.

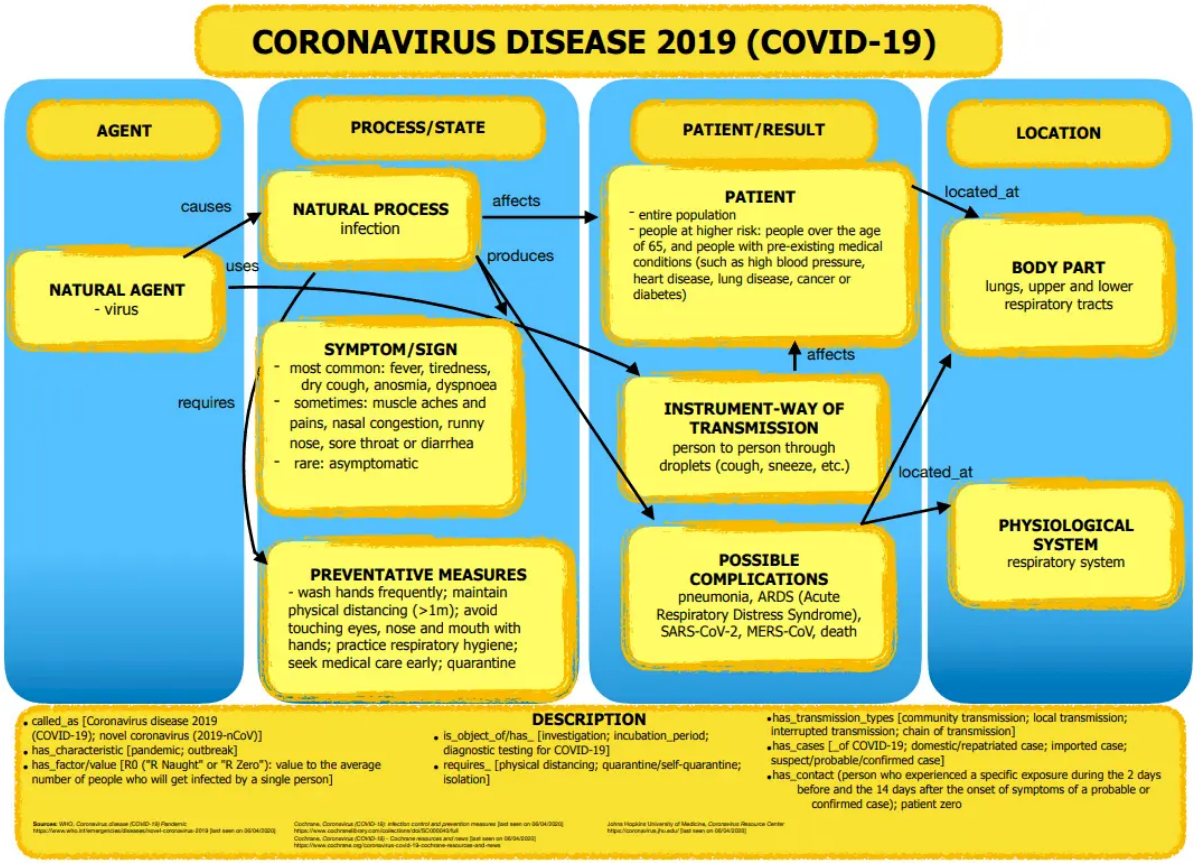

Figure 1
Frame-based representation of the CORONAVIRUS_DISEASE (European Terminology Coordination Unit).

In the representation of the Terminology Coordination Unit, we find that, with respect to our five target terms, VIRUS (and thus also *coronavirus*) is part of an overarching CORONAVIRUS DISEASE 2019 (COVID-19)-frame. The virus is seen as the AGENT – and, more specifically, a NATURAL AGENT – which can cause an infection (NATURAL PROCESS) within the carrier (PATIENT) and can be transmitted (INSTRUMENT-WAY_OF_TRANSMISSION) to another person, who will then, in turn, become a PATIENT. The frame-based representation also includes the SYMPTOMS (e.g., fever, dry cough) of and PREVENTATIVE MEASURES (e.g., frequently washing one's hand) against the virus under PROCESS/STATE, and the POSSIBLE COMPLICATIONS (e.g., pneumonia, death) under PATIENT/RESULT. Finally, some LOCATIONS are also made explicit, namely the BODY PARTS (e.g., lungs) and PHYSIOLOGICAL SYSTEM (= respiratory system) affected by the disease.

2.3. Frames as a conceptual and as a discursive notion

The frame-based representation in figure 1 covers three of the five target terms considered in our inquiry: *virus* and *coronavirus* as NATURAL AGENTS and *COVID-19* as the frame itself. The terms *epidemie* and *pandemie*, however, are not covered by this frame-based representation. This has to do with the fact that the CORONAVIRUS_DISEASE-frame concerns the disease at a physiological level, whereas *epidemie* and *pandemie* regard the situation of the disease at the level of the society. Moreover, since the scheme in figure 1 is *frame-based* and not *frame-semantic* – meaning it does not strictly adhere to frame-semantic methodology or the data provided by the BFN (cf. Section 4) –, we cannot depart from this schema for our own analysis.

However, in light of both our research questions and the missing *frame-semantic* data on our five target terms, we will establish a distinction between frames as a conceptual and frames as a discursive notion. The *conceptual frame* regards our explanation of frames in Subsection 2.1: in order to buy or sell something (cf. the COMMERCE_BUY-frame in Subsection 2.1), we should have acquired the essential knowledge regarding these topics, and thus have access to the COMMERCE_BUY-frame. Yet, this does not mean that all the FEs belonging to this frame are always made explicit in discourse. In addition, a single term can occur in many different situational contexts. For instance, terms like *virus*, *coronavirus,* and *epidemie* resurface in many different contexts in COVID-19-related texts, but not always as the main argument of the text or clause. This means that they can also appear as FEs for other frames which are not exclusive to COVID-19-related situations or health discourse. In this regard, Scholz and Ziem (2013), who investigated economic crisis discourses, and Bach (2021), who studied frames in oenological discourses, talk about *discursive frames* or *frames as a discursive notion*. In doing so, frame-semanticists are able to grasp how frames can manifest themselves differently in various discourses or between various periods of time.

Since our analysis examines the discursive use of *virus*, *coronavirus*, *COVID-19*, *epidemie* and *pandemie*, our research also deals with frames at this discursive level. Consequently, for our study, it is not necessary to have access to the conceptual frames of these target terms, since we primarily seek to describe the discursive frames in which these terms appear, particularly in light of the domain-specific functions and features of these frames in the discourse tradition of epidemiological crisis communications. In doing so, we will provide some preliminary frame-semantic insights into both this domain-specific discourse tradition, i.e., epidemiological crisis communications, and our five target terms.

3. Corpus

For our inquiry, we assembled a pilot corpus of Dutch COVID-19-related public service communications from the Belgian government. This corpus ended up containing 220 texts, 99,534 tokens, and 4,256 sentences. In this section, we will discuss it from a qualitative point of view, i.e., with regard to (i) the source of the texts, (ii) the time span of the corpus, and (iii) the types of texts these public service communications entail. The information on the type of texts derives from Liégeois and Mathysen (2022), who studied the same corpus of COVID-19-related communications from a descriptive text-linguistic point of view. Their analysis considered (a) the text function, (b) the text predicate, (c) the information structure, and (d) stylistic-formulative prototypic features of the texts. Our current qualitative discussion will later be used to evaluate the results of our corpus-based frame-semantic analysis in light of RQ2 and RQ3 – cf. the procedure in Section 4.

The texts from our corpus were all distributed by the Belgian federal government via the website www.info-coronavirus.be. This website was created by the FPS Health, Food Chain Safety and Environment,[4] and the Belgium Crisis Centre to inform the population about various aspects of the COVID-19 pandemic. As such, the texts coming from this website cannot only be regarded as public service communications, but also as crisis communications. The website offers information on this subject in the country's three official languages (Dutch, French, and German), and in English. This last language was included for foreigners staying or needing to go to Belgium, as well as foreign scientists interested in the country's epidemiological developments.

All texts from our corpus were published between January 28 and September 14, 2020. More specifically, text collection thus started when the Belgian federal government published its first news item on COVID-19 and ended shortly before an exponential increase in the number of infections and the implementation of new restrictive measures, i.e., the start of the second infection wave and lockdown, in Belgium. Consequently, our corpus mainly focuses on the first wave of Belgian COVID-19 infections and subsequent first lockdown.

With respect to content (cf. figure 2), most of the texts from this website – 178 out of the 220 texts considered here (= 80.9% of the texts) – cover epidemiological reports, which recounted the evolution of the pandemic in a very statistical manner, i.e., by elaborating on the number of (new) infections, hospitalisations, people on intensive care and deaths. These constitute clear examples of external scientific communication (cf.

[4] This is the Federal Public Service responsible for guaranteeing public health, the safety of the food chain and of the environment.

Bauernschmidt 2018), since they entail information from the fields of epidemiology and virology which is communicated to the lay public. With regard to lexical features, Liégeois and Mathysen (2022) have already established that more than half of the single-words and multi-word-expressions in both the Dutch and French versions of the corpus are part of the ontoterminological system of "epidemiology". Other individuated recurrent semantic categories were "time" and "place", which also featured in the epidemiologic crisis communications to depict the evolution of the pandemic across different regions and provinces, as well as with respect to earlier moments in time. In addition to these epidemiological reports, the corpus also contains texts depicting communicative strategies (14), repatriation reports (8) and texts with information on face masks (5) and testing strategies (4). Even though the main topic of these texts was not the epidemiological situation, they were still included in our analysis since (i) they always entailed a certain amount of epidemiological information and (ii) our five target terms almost exclusively surfaced in the text parts dedicated to this epidemiological situation.

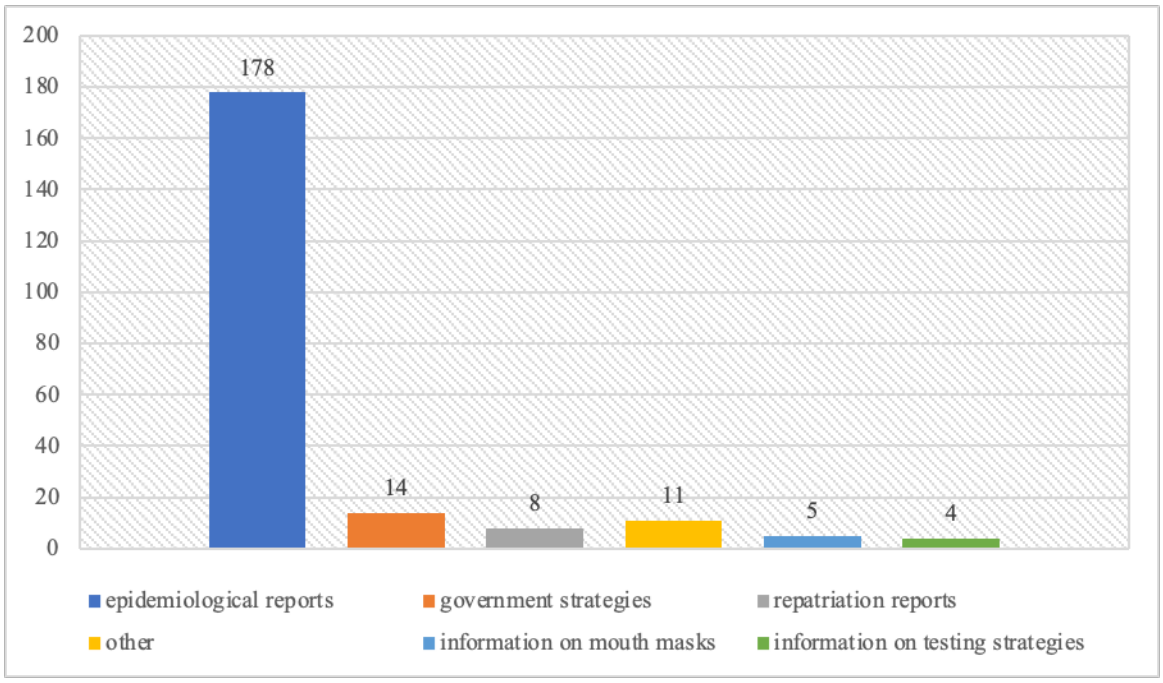

Figure 2
Texts included in the corpus.

Furthermore, the preliminary semantic analysis by Liégeois and Mathysen (2022) established two main text functions for these epidemiological crisis communications: an informative (i.e., transferring information about the development of the pandemic) and an instructive-hortative one (i.e., giving guidelines to the population or inciting them to act against the virus or follow the prescribed countermeasures). The informative text function resurfaced in

all texts in the corpus and functioned as the primary text function[5] in 214 texts (= 97.3% of the texts). The instructive-hortative function, in turn, resurfaced in 190 texts (= 86.4%), albeit only four times as the primary text function. This means that the Belgian government sought to both (i) inform the population (= communicative strategy A) and (ii) incite them to act on the dangers evoked by the pandemic (= communicative strategy B) (see Liégeois, Mathysen 2022 for more detail on these aspects of Belgian COVID-19 crisis communication).

4. Procedure

We will now elaborate on the procedure used in our inquiry, i.e., how the analysis of our data was conducted. This procedure consisted of three steps: (i) processing our corpus through Sketch Engine, (ii) individuating the frames in which our five target terms (*virus*, *coronavirus*, *COVID-19*, *pandemie* and *epidemie*) occurred, and (iii), discussing these results in regard of RQ2 and RQ3. RQ2 regards (a) which function these frames fulfil within these epidemiological reports and (b) whether other domain-specific features can be found, whereas RQ3 asks whether these frames and their domain-specific features can be linked back to the communicative strategies singled out by Liégeois and Mathysen (2022).

For the first step, we processed our compiled corpus through Sketch Engine, a computational tool for corpus-based lexicological inquiries (Kilgarriff *et al.* 2004, 2014). With the help of this corpus-linguistic program, we were able to acquire a list entailing all occurrences of our five target terms together with their intratextual context (Meibauer 2012, p. 11). This intratextual context regards the text part immediately surrounding the target term, i.e., the sentence in which it occurs, as well as the preceding and following sentence. In Sketch Engine, this intratextual context is captured by the left (LC) and right context (RC). The LC regards the intratextual context preceding the target term, whereas the RC concerns the intratextual context following the target term. A total of 889 terms was accounted for. The most frequent term was *coronavirus* (298 attestations), followed by *COVID-19* (239), *virus* (160), *epidemie* (113) and *pandemie* (79).

The second step regarded the identification and annotation of the frames in which our target terms occurred. To this end, we departed from the main verbs of the sentences in which our target terms occurred. More concretely, we looked at the English equivalents of the verbs in the BFN

[5] By "primary text function" Liégeois and Mathysen (2022) understand the text function which dominates the texts (i.e., the speech act which is evoked by most verbs in the text), while they use secondary text function to indicate the other speech acts evoked in the texts, apart from the primary ones.

Lexical Unit Index and considered which frames they evoked. If no verb was featured in the intratextual context, we looked at the frames evoked by the different nouns attested in the sentence.[6] We then proceeded to (i) consider which FEs of the BFN were present and absent within the frames found in our corpus, (ii) single out specific semantic, syntactic and pragmatic features of the attested frames, which would allow us to specify both their meaning and argument structure and thus determine whether FEs were found which are not accounted for in the BFN's Frame Index, and (iii) look for lexicological correlations, i.e., whether some frames could appear with different target terms or were limited to one of our five target terms.

Finally, for the third step, we discussed our data with respect to RQ2 and RQ3 and thus the qualitative discussion of our corpus in Section 3. For this, we looked at (i) the domain-specific function of these frames, (ii) possible other domain-specific features, (iii) whether these frames, along with their domain-specific features and functions, could be linked back to communicative strategies A ("informing the people") and B ("inciting the people to act on the spread of the virus") singled out in Section 3, (iv) which of our target terms occurred in the frames and finally, (v) whether these target terms had a fixed position in the frame, i.e., whether they always served as the same FE.

Please note that, for our analysis, we only considered those frames (a) which were evoked at least two times and across two different syntactic types (hence "frame types", cf. our discussion of the type-token-ratio in Subsection 5.1) or (b) for which only one syntactic type was found, as long as this type appeared at least 5 times in our corpus. We also did not take into account non-lexicalised frames. Furthermore, we tried to account for verbal frames (= a frame evoked by a verb) at the highest level. This means that, when we found a frame X in which one of our target terms resurfaced, which, in turn, functioned as the FE of another overarching frame Y, we only accounted for the overarching frame Y in our analysis. When such multi-layered frames occurred, these were elaborated upon in a footnote.

Regarding the limits of our research, we should point out that for step two of the analysis, we had to look at the English version of the Dutch verbs, since no Dutch FrameNet exists as yet. This is a common practice within frame-semantic studies involving languages other than English. Yet, considering frame semantics is a phylogenetic language model, the question can be posed to which extent such a "cross-linguistic" approach is without problems. Secondly, we did not consider other frame-semantic features than the ones which were outlined above. This is particularly true for those features regarding syntax, such as semantic roles. Future research will need to consider such features in more depth. Finally, from a deductive point of view,

[6] Cf. the MEDICAL_CONDITIONS-frame in Subsubsection 5.2.6.

we had the possibility to use the frame-based representation of the Terminology Coordination Unit (cf. Subsection 2.2.) as a point of reference for the results of our analysis. However, considering that many frame-semanticists (cf. Faber 2009; Ferraro *et al.* 2017; Smirnova *et al.* 2021) distinguish between "frame-semantic" and "frame-based" representations – with the latter not strictly adhering to the FEs distinguished by FrameNet and frame-semantic methodology in general –, we have abstained from doing so. Additionally, as pointed out in Subsection 2.3., this frame-based representation only considered the virus at the physiological level. The epidemiological crisis communications, however, are mainly concerned with the consequences of the virus at the level of the society.

5. Results

The results of the data analysis presented in Section 4 will be discussed here. To this aim, we will provide a first quantitative overview regarding the number of times a frame was evoked (= tokens), types, and type-token-ratio in Subsection 5.1. In Subsection 5.2, we will discuss the different frames in more detail and pay particular attention to their domain-specific features. Finally, Subsection 5.3 seeks to answer RQ2 and RQ3 by providing a comparison of the domain-specific aspects of the different frames.

5.1. First quantitative overview

Based on the methodology elaborated in Section 4, which departed from BFN's Lexical Unit Index to establish the frames in which our five target terms occurred, we were able to single out the following eight frames (cf. table 1):

Frame/category	**Tokens**	**Types**	**TTR**
REFERENCE_TEXT	234	9	0.038
ASSISTANCE	99	26	0.263
USING	94	15	0.16
CAUSE_TO_PERCEIVE	86	5	0.058
EXAMINATION	51	36	0.706
MEDICAL_CONDITIONS	45	29	0.644
DEATH	35	18	0.514
REQUEST	10	1	0.1

Table 1
Frames.

As can be observed in table 1, we also made a distinction between frame tokens (i.e., the total number of times a frame was evoked in the corpus) and

frame types (i.e., the number of distinct realisations of a frame in the corpus). This distinction concerns the fact that we are interested in frames from a discourse linguistic point of view, i.e., how these frames are used in discourse (cf. Subsection 2.3.). This is particularly important with regard to our dataset, since the Belgian government has often utilised the same text format (e.g., to communicate daily epidemiological reports) or recycled parts from earlier texts in order to communicate as consistently and fast as possible. This means that some instances of these frames reappear in exactly the same way (i.e., in an identical paragraph, with exactly the same words and word order). Liégeois and Mathysen (2022) argued that this recycling of texts and text parts is a typical feature of crisis communication, since it is an economic and consistent way to repeatedly communicate information about the epidemiological situation. This recycling of texts, in turn, resulted in a low type-token-ratio (= TTR) for certain frames – see the REFERENCE_TEXT (TTR = 0.038) and CAUSE_TO_PERCEIVE-frame (TTR = 0.058) in table 1. For instance, (2a), an example of the REFERENCE_TEXT-frame, occurred 112 times in the corpus and (2b), an example of the CAUSE_TO_PERCEIVE-frame, 78 times.

(2) a. Dt.: *Bekijk het volledige dagelijkse rapport met de nationale epidemiologische situatie van het coronavirus*.
'Look at the complete daily report with the national epidemiological situation of the coronavirus.'

b. Dt.: *Deze toont de aanwezigheid van het coronavirus SARS-COV-2 op gemeentelijk niveau op basis van 3 indicatoren*:
'This shows the presence of the coronavirus SARS-COV-2 at the municipal level on the basis of 3 indicators:'

In what follows, we will discuss each of the frames in table 1 in more detail, with particular attention to the differences they manifest compared to their entry in the BFN Frame Index, and whether these can be regarded as domain-specific features. Please note, however, that, as explained in Section 4, we have only considered those frames (a) which were accounted for at least two times and across two different types or (b) for which only one type was found, if this type appeared at least 5 times in our corpus (cf. Section 4). Hence, of the 889 hits in our corpus for our five target terms, 664 were eventually considered here. For the other 225 hits, no apt frames were found or there were only frames with a frequency lower than the one outlined above. As such, these low frequency frames will not be discussed in the following subsection.

5.2. Discussion of the frames

In this section, we will establish a qualitative discussion of the eight frames distinguished in table 1. More specifically, we will discuss (i) their quantitative features (AF of tokens and types, as well as TTR), (ii) the verbs by which they are evoked and the target terms found within them, (iii) the information provided about them by the BFN's Frame Index, (iv) point out the FEs present or absent in these frames, and (v), discuss these frames in light of possible domain-specific aspects, for which we will draw from our corpus discussion in Section 3, as well as the previous study by Liégeois and Mathysen (2022). An overview of the domain-specific features of all frames is provided in Subsection 5.3.

5.2.1. REFERENCE_TEXT

The most frequent frame in our corpus was the REFERENCE_TEXT-frame, which occurred 234 times. However, this was also the frame with the lowest TTR (0.038), since only nine types were found. The target terms surfacing within this frame included *coronavirus*, *COVID-19,* and *epidemie*. This frame was evoked by verbs like *bekijken* ("to look at").

This frame is defined by BFN as follows:

> In a text, a SOURCE_OF_INFORMATION is given that provides a reader of the text with further INFORMATION relevant to the text. In this frame the author and reader are completely deprofiled, with the SOURCE_OF_INFORMATION made salient. (BFN – Frame Index: REFERENCE_TEXT)

An example from our own corpus is given in (3):

(3) Dt.: *Bekijk*FEE *het volledige dagelijkse rapport*SOURCE *met de (inter)nationale epidemiologische situatie van het coronavirus*INFORMATION.
'Look at the complete daily report with the (inter)national epidemiological situation with regard to the coronavirus.'

Here, we find that both FEs, SOURCE_OF_INFORMATION (CORE) and INFORMATION (NON-CORE) are always present in the frame (cf. table 2). In one sentence, the SOURCE_OF_INFORMATION-FE was even accounted for twice, which explained why it is attested 235 times across 234 frames. The SOURCE_OF_INFORMATION-FE always regarded other epidemiology-related texts provided by the Belgian Crisis Centre and the INFORMATION-FE exclusively entails epidemiological information on the COVID-19 pandemic. Therefore, the link of this frame with the strategy of informing the population (communicative strategy A) is evident. Regarding the specific modalities of (3), we can also link the imperative mood of the verb *bekijken* to the

instructive-hortative text functions mentioned in Section 3.

FE	Nr. of FEs	Nr. of frames[7]
SOURCE_OF_INFORMATION	235	234
INFORMATION	234	234

Table 2
REFERENCE_TEXT-frame.

5.2.2. *ASSISTANCE*

The second most frequent frame in our corpus was the ASSISTANCE-frame, which occurred 99 times across 26 types (TTR = 0.263). This frame was attested with all five target terms and was evoked by verbs like *helpen* ("to help") and *opletten* ("to pay attention to") (4):[8]

(4) a. Dt.: *Zo helpt*FEE *iedereen*HELPER *de voortgang van de pandemie te vertragen*GOAL/1 *en de meest kwetsbaren onder ons*BENEFITED_PARTY *te beschermen*GOAL/2.
'In this way, everyone helps to slow down the progression of the pandemic and to protect the most vulnerable among us.'

b. Dt.: *Let extra* opFEE *bij mensen die gevoelig zijn voor het virus*BENEFITED_PARTY.
'Be extra careful with people who are vulnerable to the virus.'

According to the BFN's Frame Index entry, here, "a HELPER benefits a BENEFITED_PARTY by enabling the culmination of a GOAL that the BENEFITED_PARTY has. A FOCAL_ENTITY that is involved in reaching the GOAL may stand in for it" (BFN – Frame Index: ASSISTANCE).

The instances of the ASSISTANCE-frames identified within our corpus diverged from the information provided on it by the BFN in that the GOAL is not necessarily set out by the BENEFITED_PARTY, but rather by the government or society as a whole. When looking at the attested FEs of the frame (cf. table 3) in our corpus, we find that all four CORE FEs are present, even though FOCAL_ENTITY is only accounted for 14 times. GOAL is accounted for 95 times, BENEFITED_PART 89 times and HELPER 84 times. Other attested FEs, included as NON-CORE FEs in the BFN entry, are

[7] In the column 'FEs', we registered how many instances of the FE were found, whereas in the column 'frames', we registered the number of frames instances in which the FE appeared.

[8] The examples in (4) entail multilayered-frames: in (4a), our target term *pandemie* is part of the EXPANSION-frame (which functions as part of the GOAL-FE), and in (4b), our target term *virus* is part of the HEALTH_RESPONSE-frame (which functions as part of the BENEFITED_PARTY-fe) (cf. BFN – Frame Index: EXPANSION; HEALTH_RESPONSE).

INSTRUMENT (21 attestations), TIME (4 attestations), PLACE (2 attestations), and PURPOSE (1 attestation).

FE	Nr. of FEs	Nr. of frames
GOAL	95	91
BENEFITED_PARTY	89	85
HELPER	84	84
INSTRUMENT	21	11
FOCAL_ENTITY	14	13
TIME	4	4
PLACE	2	2
PURPOSE	1	1

Table 3
ASSISTANCE-frame.

For our corpus, we also notice that further semantic restrictions apply to the BENEFITED_PARTY-FE, which is always a part of the population that is particularly vulnerable to the COVID-19-disease. In doing so, this BENEFITED_PARTY-FE is always a frame on its own, namely the HEALTH_RESPONSE-frame (in (7a), it is evoked by the noun *kwetsbaren* and, in (7b), by the VP *gevoelig zijn*) and all 85 frames in which the term occurs are multilayered ones. The function of this frame can be linked back to the communicative strategy of inciting the population to act on the spread of SARS-CoV-2 (communicative strategy B) singled out by Liégeois and Mathysen (cf. Section 3). With this frame, the Belgian Crisis Centre thus sought to incite the population (= HELPER) to act on the dangers evoked by the pandemic (= GOAL), particularly in the interest of a BENEFITED_PARTY. The INSTRUMENT-FE, in turn, regards either the recommendations set out by the government or those objects (e.g., face masks, hand sanitizers) which can be used to prevent infections.

5.2.3. *USING*

The USING-frame was evoked 94 times is our corpus, across 15 types (TTR = 0.16). This frame occurred with *coronavirus*, *virus*, *pandemie* and *epidemie*. In the following sentence (5),[9] the frame is evoked by the verb *toepassen* ("apply"):

[9] In (5) we again find a multilayered frame. The CIRCUMSTANCES-FE is, in fact, an instance of the DEPARTING-frame (BFN – Frame Index: DEPARTING), evoked by the past participle *verdwenen* ("disappeared"). Moreover, the sentence in (5) is also an example of the non-lexical RISK_SCENARIO-frame (BFN – Frame Index: RISK_SCENARIO). Such non-lexical frames, however, were not considered in the current analysis.

(5) Dt.: *Het virus is niet verdwenen uit ons land*CIRCUMSTANCES. *Blijf dus de tips*INSTRUMENT *toepassen*FEE *om jezelf en je familie te beschermen*PURPOSE.
'The virus has not disappeared from our country. Keep applying the tips to protect yourself and your family.'

In this frame, "an AGENT manipulates an INSTRUMENT in order to achieve a PURPOSE" (BFN – Frame Index: USING). In our own corpus (cf. table 4), however, we find that only INSTRUMENT (97) and PURPOSE (84) resurface with attestations of this frame. This has to do with the fact that the frame-evoking verb is always in the imperative mood, for which no AGENT needs to be specified in the clause. Other NON-CORE FEs found with this frame are CIRCUMSTANCES, which resurfaces 81 times, CONTAINING_EVENT (7 attestations), MEANS (5 attestations), EXPLANATION (2 attestations), MANNER (1 attestation,) and PLACE (1 attestation). These are all also included in the BFN-entry.

FE	**Nr. of FEs**	**Nr. of frames**
INSTRUMENT	97	94
PURPOSE	84	84
CIRCUMSTANCES	81	81
CONTAINING_EVENT	7	7
MEANS	5	3
EXPLANATION	2	2
MANNER	1	1
PLACE	1	2

Table 4
USING-frame.

For the INSTRUMENT-FE, we find that, just like within the ASSISTANCE-FE (cf. Subsubsection 5.2.4.), this FE regards either the recommendations formulated by the government (cf. (5)) or objects like face masks and hand sanitizers which could be used to prevent infection. Furthermore, this frame, again like the ASSISTANCE-frame, can be linked to communicative strategy B. Again, the government sought to incite the population to act against the spread of the virus (PURPOSE), in this case by adhering to the recommendations which they issued or through preventive objects (INSTRUMENT). The CIRCUMSTANCES, in turn, entail the danger imposed by the virus or the current situation of the pandemic. This inciting communicative strategy becomes even more clear in the examples above, where the imperative mood evokes the instructive-hortative speech act.

5.2.4. CAUSE_TO_PERCEIVE

The CAUSE_TO_PERCEIVE-frame was accounted for 86 times in our corpus. It manifested itself in 5 different types, being the frame with the second lowest TTR (0.058). This frame was evoked by verbs like *tonen* ("show"), *objectiveren* ("objectify") or the VP *een idee geven van* ("give an idea about"). It featured two of our target terms: *coronavirus* and *epidemie*. See the example provided in (6):

(6) Dt.: […] *op onze website. Deze*MEDIUM *toont*FEE *de aanwezigheid van het coronavirus SARS-COV-2*PHENOMENON *op gemeentelijk niveau*PLACE *op basis van 3 indicatoren*MEANS.
'On our website. This shows the presence of the coronavirus SARS-COV-2 at the municipal level on the basis of 3 indicators:'

In this frame, "an AGENT, ACTOR, ENTITY or MEDIUM causes a PHENOMENON to be perceived by a PERCEIVER. With an ACTOR, ENTITY, or MEDIUM, the PERCEIVER is usually unspecified" (BFN – Frame Index: CAUSE_TO_PERCEIVE). In our corpus, it is a MEDIUM which causes the PHENOMENON to be perceived. Consequently, the PERCEIVER, which is the reader himself, remains unspecified. The MEDIUM is always the website of the Belgian Crisis Centre and the PHENOMENON an aspect of or the entire epidemiological situation. Hence, the two target terms *coronavirus* and *epidemie* are always part of the perceived PHENOMENON (cf. (6)). Other NON CORE-FEs are MEANS (85 occurrences), PLACE (79 occurrences), PURPOSE (7 occurrences), and MANNER (5 occurrences) (cf. table 5).

FE	**Nr. of FEs**	**Nr. of frames**
PHENOMENON	86	86
MEDIUM	86	86
MEANS	85	85
PLACE	79	79
PURPOSE	7	7
MANNER	5	5

Table 5
CAUSE_TO_PERCEIVE-frame.

In our corpus, the CAUSE_TO_PERCEIVE-frame always regards the question of how epidemiological information is/should best be represented. This frame thus reflects communicative strategy A to inform the population from a more metareflective or even metalinguistic perspective. This also explains the high frequency of the NON-CORE MEANS-FE (85 occurrences), which details the way in which information is represented ((6): *op basis van 3 indicatoren*).

5.2.5. *EXAMINATION*

The fifth frame was the EXAMINATION-frame[10], with 51 occurrences. This frame had both the highest frequency when it came to the number of types (36) and the highest TTR (0.706) of the frames in our corpus. It featured three of our target terms: *virus*, *coronavirus,* and *COVID-19*. In (7),[11] the frame is evoked by the verb *testen* ("to test").

(7) a. Dt.: *Gemiddeld hebben* *in die periode*TIME *550,3 mensen per dag*EXAMINEE/DEGREE *positief*RESULT *getest*EXAMINATION *voor COVID-19*TESTED_PROPERTY.
'On average, in that period, 550.3 people per day have tested positive for COVID-19.'

b. Dt.: *Eén gerepatrieerde landgenoot*EXAMINEE *testte*EXAMINATION *positief*RESULT *op het nieuwe coronavirus*TESTED_PROPERTY.
'One repatriated compatriot tested positive for the new coronavirus.'

Certain differences, however, need to be pointed out with respect to its entry in the BFN Frame Index. Here, the frame is said to deal with the "testing or examination of someone's KNOWLEDGE or skill in a particular area. An EXAMINER conducts an EXAMINATION to an EXAMINEE to determine the EXAMINEE's KNOWLEDGE and/or determine their QUALIFICATION for some privilege; this proceeds either by the EXAMINEE demonstrating a skill or by writing responses to questions" (BFN – Frame Index: EXAMINATION). In our corpus, it is not a knowledge or skill which is tested and serves as the TESTED_PROPERTY, but the possible infection of a group of people (= EXAMINEES) with the entity denoted by the three target terms *virus*, *coronavirus,* and *COVID-19*. This difference is, in part, due to the different primary meanings of *to test* in English and *testen* in Dutch. Consequently, THE QUALIFICATION-FE is not found in those structures which we annotated as manifestations of the EXAMINATION-frame (cf. table 6). The CORE-FEs of EXAMINEE (108 occurrences), EXAMINATION (51 occurrences) and EXAMINER (19 occurrences) however, remain present. Other attested NON-CORE FEs are RESULTS (59 occurrences), PLACE (53 occurrences), TIME (48 occurrences), DEGREE (21 occurrences) and PURPOSE (1 occurrence).

[10] In the BFN's Frame Index, there are also other frames which concern the analysis/verification of data, namely the SCRUTINY-frame and its subframes SCRUTINIZING_FOR and VERIFICATION (BFN – Frame Index: SCRUTINY; SCRUTINIZING_FOR; VERIFICATION). However, *to test* is not mentioned as a possible lexical unit for any of these three frames.

[11] In the sentence in (7b), the TESTED_PROPERTY-FE is, in turn, a manifestation of the FAMILIARITY-frame (BFN – Frame Index: FAMILIARITY), evoked by the adjective *nieuw* ("new").

FE	Nr. of FEs	Nr. of frames
EXAMINEE	108	57
TESTED_PROPERTY	62	61
RESULTS	59	57
PLACE	53	28
EXAMINATION	51	51
TIME	48	48
DEGREE	21	21
EXAMINER	19	19
PURPOSE	1	1

Table 6
EXAMINATION-frame.

This frame concerns the communicative strategy to inform the population (communicative strategy A) and is strongly connected to the ontology of the domain-specific discourse tradition, since the texts considered here frequently elaborated on averages when it came to both the number of tests executed and the results of those tests. Prove of this is the DEGREE-FE (cf. (7a)), which is not included in the entry from the BFN and concerns the average data for the number of tests executed, as well as their results. Furthermore, this DEGREE-FE also resurfaces in the MEDICAL_CONDITIONS- and DEATH-frames (cf. Subsubsections 5.2.6. and 5.2.7.), which are both also included in the text parts of the epidemiological crisis communications that elaborate on the statistical data regarding the epidemiological situation. The frequency of RESULTS, PLACE, and TIME – the former two are more frequent than the CORE-FEs of EXAMINATION and EXAMINER and the latter more frequent than the EXAMINER-FE – can be explained based on features of the domain-specific discourse traditions. The results of the tests (RESULTS), in fact, were also important features of the epidemiological situation which needed to be communicated with respect to the different regions (PLACE) and for which comparison with data from the previous days and weeks (TIME) were in order (cf. our explanation in Section 3).

5.2.6. *MEDICAL_CONDITIONS*

Of the MEDICAL CONDITIONS-frame, 45 instances were found across 29 types, making it the frame with the second highest TTR (0.644). Contrary to the other frames, this frame was not evoked by verbs, since no verbs were found in the sentences featuring it and these sentences often stood on their own (i.e., as a title, subtitle, or in an enumeration). Consequently, this frame was evoked by nouns like *gevallen* (“cases”, (8a)), *symptomen* (“symptoms”), and *besmettingen* (“infections”, (8b)), which were always used in combination with a target term denoting the virus (*virus, coronavirus*) or the disease itself

(*COVID-19*, (8)).

(8) a. Dt.: *Zes*QUANTIFIER *nieuwe gevallen van Covid-19*AILMENT *na einde krokusvakantie*TIME.
'Six new cases of COVID-19 after spring break.'

b. Dt.: *1684*QUANTIFIER *nieuwe besmettingen met Covid-19*AILMENT.
'1,684 new infections with COVID-19.'

The following definition is provided by the BFN:

> Words in this frame name medical conditions or diseases that a patient suffers from, is being treated for, may be cured of, or die of. The condition or disease may be described in a variety of ways, including the part or area of the body (BODY_PART) affected by the condition (e.g. liver cancer, cardiovascular disease), the CAUSE of the condition (e.g. bacterial meningitis, viral pneumonia), a prominent SYMPTOM of the condition (e.g. asymptomatic stenosis, blue ear disease), the PATIENT or population (originally) affected by the condition (e.g. bovine tuberculosis, juvenile diabetes), or the (proper) NAME used to identify the condition (e.g. Munchausen Syndrome, Lou Gehrig's Disease). Annotation in this frame is done in respect to the name of the condition or disease. (BFN – Frame Index: MEDICAL_CONDITIONS)

Within the attestations in our corpus, we find that the MEDICAL_CONDITIONS-frame revolves almost exclusively (42 of the 45 frames) around the cases and infections with COVID-19. The number of cases and infections were communicated together with the number and results of tests (EXAMINATION-frame, cf. Subsubsection 5.2.5) and the number of deaths (DEATH-frame, cf. Subsubsection 5.2.6.).

Since these frame instances had an epidemiological rather than physiological scope, no instances of the BODY_PART-FE could be found with the frames attested in our corpus (cf. table 7). The CORE FE of AILMENT was present in all frames and featured one of the three nouns (*gevallen, besmettingen, symptomen*) and one of the three target terms (*virus, coronavirus, COVID-19*) mentioned above. Therefore, the AILMENT-FE also evoked the NAME-FE each time. The PATIENT-FE, however, only recurred 20 times (cf. (8)) – and the SYMPTOM-FE only in three frames (i.e., the three instances of this frame which did not concern the number of infections).

FE	**Nr. of FEs**	**Nr. of frames**
AILMENT	45	45
NAME	45	45
QUANTIFIER	32	32
TIME	21	14
PATIENT	20	20
PLACE	9	9

DEGREE	5	3
SYMPTOM	3	3

Table 7
MEDICAL_CONDITIONS-frame.

With this frame, various FEs were attested which reflected other features of epidemiological crisis communications, like QUANTIFIER (32 occurrences) and DEGREE (5 occurrences), which relate to the statistics of these communications. The same is true for TIME (21 occurrences) and PLACE (5 occurrences), which, as explained in the previous subsubsection, allow the apt description of the evolution of the pandemic across the country and different moments in time. Two of these FEs, QUANTIFIER and TIME, were not present in the BFN entry for this frame.

Considering that data about the number of infections served to give the population an idea about the evolution of the pandemic, these frames can be connected to the informative strategy (communicative strategy A) singled out by Liégeois and Mathysen (2022), as can be the other frames found in its vicinity, namely EXAMINATION (cf. Subsubsection 5.2.5.) and DEATH (cf. Subsubsection 5.2.7.).

5.2.7. *DEATH*

The penultimate frame found in our corpus was the DEATH-frame, which regarded the POSSIBLE COMPLICATIONS of the disease. This frame was featured 35 times across 18 different types, amounting to a TTR of 0.514, which was the third highest TTR among the frames. This frame was evoked by verbs like *overlijden* ("to pass away") and *sterven* ("to die"). The DEATH-frame was found with the target terms *coronavirus* and *COVID-19*. See also the examples in (9):

(9) a. Dt.: *Gemiddeld overlijden*FEE *er 2 mensen per dag*DEGREE *met COVID-19*CAUSE.
'On average, two people a day pass away with COVID-19.'

b. Dt.: *In de voorbije week*TIME *sterven*FEE *ook gemiddeld 2 personen per dag*DEGREE *met COVID-19*CAUSE.
'In the past week, on average, two people a day died with COVID-19.'

The BFN describes this frame as "the death of a PROTAGONIST. A CAUSE of death may also be expressed obliquely" (BFN – Frame Index: DEATH). Due to the statistical writing style mentioned in the previous Subsubsections (5.2.5. and 5.2.6.), the PROTAGONIST-FE was only accounted for 9 times (cf. table 8). This was, consequently, in favour of the more "statistical" DEGREE-FE (29 attestations). The CAUSE-FE was present in all frames and always occupied by

our two target terms *coronavirus* and *COVID-19* (cf. (9)). NON-CORE FEs relating to TIME (27 attestations) and PLACE (7 attestations) were also found, once again in line with the information structure of the texts considered here (see again the previous two subsubsections). Finally, 3 instances of the MALEFICIARY-frame (i.e., persons negatively affected by the death of a PROTAGONIST) were also accounted for.

FE	**Nr. of FEs**	**Nr. of frames**
CAUSE	35	35
DEGREE	29	28
TIME	27	27
PROTAGONIST	9	9
PLACE	7	7
MALEFICIARY	3	3

Table 8
DEATH-frame.

Since this frame mainly concerns the transmission of epidemiological information regarding the number of deaths, it can be linked with communicative strategy A, like the EXAMINATION- and MEDICAL_CONDITIONS-frames.

5.2.8. *REQUEST*

The final frame identified through our analysis was the REQUEST-frame, of which only one type was found. This type (10) recurred 10 times in our corpus, amounting to a TTR of 0.1.

(10) a. Dt.: *Volg ons*FEE *hier, op Twitter of op Facebook*MEDIUM *om op de hoogte te blijven*BENEFIT *van alle nieuws*MESSAGE *over het nieuwe coronavirus*TOPIC.
'Follow us here, on Twitter or on Facebook to stay up-to-date regarding all news on the new coronavirus.'

Here, the frame is evoked by the verb *volgen* ("follow"), which stands in the imperative mood – therefore evoking the instructive-hortative text function discussed in Section 3. The frame is defined by BFN as follows: "in this frame a SPEAKER asks an ADDRESSEE for something, or to carry out some action" (BFN – Frame Index: REQUEST). Four CORE-FEs are defined: the ADDRESSEE, the MEDIUM, the MESSAGE and the SPEAKER.

Regarding the REQUEST-frame from our corpus (10), we see that both ADDRESSEE and SPEAKER are not present, which is to be expected, since the verb is in the imperative mood. However, both MEDIUM (*hier, op Twitter of op Facebook*) and MESSAGE (*alle nieuws*) are present, just like two NON-CORE

FEs: TOPIC (*over het nieuwe coronavirus*), that is, what the MESSAGE is about, and BENEFIT (*om op de hoogte te blijven*) (cf. table 9).

FE	Nr. of FEs	Nr. of frames
MESSAGE	10	10
MEDIUM	10	10
TOPIC	10	10
BENEFIT	10	10

Table 9
REQUEST-frame.

This last frame can be linked to both communicative strategies singled out by Liégeois and Mathysen (2022), since it implores the population (= communicative strategy B) to follow the Belgian Crisis Centre to stay up to date on the information regarding the new coronavirus (= communicative strategy A).

5.3. Comparison

This subsection will provide a comparative qualitative overview of our eight frames in light of RQ2 and RQ3. To this aim, in table 10, we sought to (i) define a main function for our frames within this domain-specific discourse tradition, (ii) single out those features which could be considered domain-specific, (iii) single out the relevant communicative strategy for each frame, (iv) determine which target terms appeared in these frames, and (v) whether these target terms had a fixed position, i.e., whether they always resurfaced in the same FE.

When it comes to the data presented in table 10, we were, in fact, able to define a function for each of the frames with respect to the features and needs of epidemiological crisis communications. In the cases of the EXAMINATION-, MEDICAL CONDITIONS- and DEATH-frames, these regarded the statistical representation of epidemiological information. Please note, however, that these functions cannot be regarded as absolute for the MEDICAL CONDITIONS- and DEATH-frame, since we also found a few attestations of these frames – cf. the three MEDICAL CONDITIONS-frames revolving around the SYMPTOM-FE and the nine DEATH-frames entailing the DEATH of a PROTAGONIST (3 of which also contain the MALEFICIARY-FE) – which do not correspond to said definition.

The domain-specific features, in turn, were defined in view of (i) the functions established for the frames and (ii) the quantitative and qualitative differences accounted for with respect to their entry in the BFN Frame Index. In this regard, domain-specific features are found for six of our frames. From a qualitative point of view, the influence from the domain is very clear within

the EXAMINATION-frame, since TESTED_PROPERTY does not regard some type of knowledge or skill within our corpus, but instead the possible infection of a person. The same is true for, for instance, the absence of a QUALIFICATION-FE in this frame or the absence of the BODY_PART-FE in the MEDICAL_CONDITIONS-frame. An example of a quantitative difference is the frequent manifestation of the DEGREE-FE in the DEATH-frame and the subsequent lower frequency of the CORE-FE of the PROTAGONIST within the same frame.

Finally, we were also able to connect these frames and their respective function to the two communicative strategies singled out by Liégeois and Mathysen (2022 – cf. Section 3). In this regard, we remark that seven frames reflect communicative strategy A of informing the population and three frames communicative strategy B of inciting the population to act against the spread of the virus. This quantitative difference, in turn, corresponds to the data provided by Liégeois and Mathysen (2022), who noticed that the informative speech act is the main text function in 214 (= 97.3%) of the 220 texts.

When it comes to the appearance and position of our five target terms, we find that *coronavirus*, which was the most frequent term in our corpus, appears within all eight frames. Furthermore, we find that the EXAMINATION-, MEDICAL_CONDITIONS- and DEATH-frames appear to be exclusive to those terms denoting either the virus or the disease, i.e., *coronavirus, virus* and *COVID-19*. Similar observations can be made for the REQUEST-frame, which only features *coronavirus*, but this is because only one type of this frame was found. Finally, we notice that these target terms have a fixed position within six frames: REFERENCE_TEXT, CAUSE_TO_PERCEIVE, EXAMINATION, MEDICAL_CONDITIONS, DEATH and REQUEST.

Please note that, regarding domain-specific features, many FEs frequently denote the same aspects of the epidemiological situation/communication, like the SOURCE_OF_INFORMATION-FE from the REFERENCE_TEXT-frame, which always regarded epidemiology-related texts provided by the Belgian Crisis Centre (cf. 5.2.1.). However, these regularities/domain-specific features were not registered in table 10.

Frame	Main function	Domain-specific features	Strategy	Target terms	Fixed position?
REFERENCE_TEXT	Provide the reader with additional information regarding the epidemiological situation.	/	A	*coronavirus, covid-19, epidemie*	Part of INFORMATION-FE
ASSISTANCE	Incite the population to help (i) the government in their fight against SARS-CoV-2 and/or (ii) people particularly vulnerable to the virus.	- The GOAL-FE is not necessarily set out by the BENEFITED_PARTY.	B	*virus, coronavirus, COVID-19, pandemie, epidemie*	No
USING	Implore the population to adhere to the guidelines set out by the government and/or properly use those objects (e.g., face masks) meant to stop infections.	- No AGENT-FE due to the imperative mood.	B	*coronavirus, virus, pandemie, epidemie*	No
CAUSE_TO_PERCEIVE	Communicate information on how epidemiological data is represented.	/	A	*coronavirus, epidemie*	Part of PHENOMENON-FE
EXAMINATION	Recount the number of (positive) tests for COVID-19.	- TESTED_PROPERTY-FE does not concern knowledge or skill but a possible infection. - No QUALIFICATION-FE.	A	*virus, coronavirus, COVID-19*	Equals TESTED_PROPERTY-FE
MEDICAL_CONDITIONS	Recount the number of infections (or positive cases) due to COVID-19.	- No BODY_PART-FE due to the epidemiological scope of the frame. - Attested QUANTIFIER- and TIME-FEs, which are in line with the statistical way of communication.	A	*virus, coronavirus, COVID-19*	Part of AILMENT-FE, equals NAME-FE
DEATH	Recount the numbers of deaths due to COVID-19.	- Few attestations of the PROTAGONIST-FE due to statistical way of communicating information (which is in favour of the DEGREE-FE).	A	*coronavirus, COVID-19*	Equals CAUSE-FE
REQUEST	Implore the population to stay up-to-date on information surrounding the new coronavirus.	- No SPEAKER- or ADDRESSEE-FE present due to the imperative mood.	A & B	*Coronavirus*	Equals TOPIC-FE

Table 10
Texts included in the corpus.

6. Summary and notes for future research

In our introduction (cf. Section 1), we situated our study within the paradigm of frame-semantic research on domain-specific discourse, which was explained in more depth in Section 2. The aim of our inquiry was to look into a domain-specific discourse tradition which has, up until now, remained untouched by frame-semanticists, namely epidemiological crisis

communications, regarding in this case the COVID-19 health pandemic. In this regard, we formulated the following three research questions: In which frames do our five target terms – *virus*, *coronavirus*, *COVID-19*, *pandemie* and *epidemie* – resurface within this domain-specific discourse tradition (RQ1)? Which functions do these frames fulfil within this domain-specific discourse tradition and can other domain-specific features (e.g., regarding the FEs of these frames) be found (RQ2)? Can these frames and their functions be linked back to the communicative strategies singled out by previous research on these Belgian epidemiological crisis communications (Liégeois, Mathysen 2022) (RQ3)?

To this end, we collected a corpus of Dutch COVID-19-related public service communications from the Belgian government, which previous research (cf. Liégeois, Mathysen 2022) determined to be examples of such epidemiological crisis communications: most of these texts were epidemiological reports and epidemiological information and terminology were accounted for in all other texts as well (cf. Section 3). As explained in our procedure in Section 4, we then singled out the frames in which our five target terms occurred based on the data provided by BFN's Lexical Unit Index and looked for domain-specific aspects of these frames based on (i) the information provided on these by BFN's Frame Index and (ii) the qualitative corpus discussion in Section 3.

Eventually, eight frames were singled out by our analysis: REFERENCE_TEXT, ASSISTANCE, USING, CAUSE_TO_PERCEIVE, EXAMINATION, MEDICAL_CONDITIONS, DEATH, and REQUEST (cf. Subsection 5.1). By discussing these frames in more depth in Subsection 5.2, we were then able to define the specific functions of these frames in light of the features and needs of epidemiological crisis communications in Subsection 5.3. This subsection also included observations about domain-specific features and which frames could be connected to which communicative strategy. Finally, it also specified which target terms were found in the frames and their respective positions therein.

With this pilot study, we hope to have established some preliminary insights into epidemiological crisis communications from a frame-semantic point of view. However, it remains imperative that more studies are done in this area. This research needs to regard both other manifestations of such epidemiological crisis communications – e.g., including those regarding different epidemics, like the obesity epidemic (cf. Stroebel *et al.* 2016) and the H1N1-epidemic (cf. Aylesworth-Spink 2017) –, as well as contrastive studies involving other closely related discourse traditions, like economic crisis communications (cf. Scholze, Ziem 2013) and other forms of (COVID-19-related) public service or government communication. Furthermore, it is worthwhile considering whether the frames identified in our texts during this inquiry remain consistent across their translations into Belgium's two other

national languages (French, German) and English. Based on the information provided by the BFN, such differences between discourse traditions and languages can be aptly studied.

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