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INFOGRAPHICS AS A BLEND OF VERBAL AND VISUAL MATRICES IN SCIENTIFIC TEXTS

INFOGRAFIAS COMO MESCLA DAS MATRIZES VERBAIS E VISUAIS EM TEXTOS DE DIVULGAÇÃO CIENTÍFICA

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ABSTRACT: Infographics can be seen as a form of communication that mixes the verbal and the visual matrices in the same context. Newspapers are increasingly using infographics as a way to visually broaden scientific knowledge that in some cases the reader needs to refer to the verbal text to understand. This article reflects on how infographics behave in scientific texts: a way to think about the world through the surface where verbal and visual matrices coexist, unlike products that are typical of line culture. The purpose of the investigation is also to discuss how infographics have an autonomous existence in scientific texts, apparently having a complete and independent meaning. As an empiric object for the discussion, two scientific texts from the section Health and Well-being (published on Folha.com, the website of a newspaper with a wide distribution in Brazil) were analyzed. Drawing back on Santaella's (2005) and Flusser's (2007) theoretical framework, qualitative analysis was undertaken along with the quantification of articles displaying infographics. We have concluded that Folha.com's infographics were seen as mechanisms capable of displaying sufficient information that is needed for the comprehension of science communication texts.

KEYWORDS: Infographics. Scientific articles. Verbal matrix. Visual matrix. *Folha.com*.

RESUMO: Infografias podem ser vistas como forma de comunicação que mescla as matrizes verbais e visuais no mesmo contexto. Os jornais estão cada vez mais usando as infografias como meio de ampliar visualmente os conhecimentos que, em alguns casos, o leitor precisa para usar para entender o texto verbal. Este artigo reflete sobre como infografias se comportam em textos de divulgação científica: um caminho para pensar o mundo por meio da superfície em que as matrizes verbais e visuais coexistem ao contrário dos produtos típicos da cultura de linha. O propósito da investigação é também discutir como a infografia tem existência autônoma nos textos de divulgação científica, aparentemente tendo sentido completo e independente. Do ponto de vista metodológico, privilegiou-se análise de dois textos de divulgação científica da seção *Saúde* e *Bem-Estar*, publicados no *Folha.com*, o site de um jornal de grande circulação no Brasil, que tivessem uso de infografias. A partir do aporte teórico de Santaella (2005); Flusser (2007), dentre outros procedeu-se a análise qualitativa, bem como se buscou fazer a quantificação de artigos com e sem o uso de infografias. Chega-se à conclusão de que os infográficos do Folha.com eram vistos como mecanismo para exibir informações suficientes para a compreensão dos textos de divulgação. Agora, infográficos nos jornais são essenciais para a compreensão da leitura dos textos de divulgação e os leitores os consideram antes da leitura das palavras.

PALAVRAS-CHAVE: Infografias. Textos científicos. Matriz verbal. Matriz visual. *Folha.com*.

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Introduction

Infographics can be thought of as a form of communication that mixes verbal and visual language in the same context. They may also be understood as objects created using computers. According to Bettetini (1993), they essentially use a technique that enables models of objects to be made by computer operated simulation procedures.

Infographics can be used in many fields. They are hybrid material that can be used in books, catalogues for businesses, in science, physics, advertising, and most importantly in mass media. Infographics are seen in most print and online newspapers to produce the effect of meaning intended, which is to inform. The newspaper sections that make scientific discoveries noteworthy stand out in their use of infographics as information tools. For this reason, this paper discusses how infographics in science articles are dealt with in the *Health and Well-being* section of the site *Folha.com*. The objective is to bring the infographic, image, or illustration that generates meaning into a process that shifts a person's attention away from a linear reality to a surficial reality. In this case study, the image will not be relegated to be a mere illustration of the text.

This work is justified because it examines the relationship between image and text by bringing into question the idea of the image as an extension of the text and emphasizes the informational content of the image itself. Another reason for the study is the fact that it considers that with the advent of the personal computer and computers used in business, the infographic was brought to sight and a new hybrid language of words and images has come to be widely used, especially in the mass media.

The hypothesis that leads to this reflection is that newspapers have been using infographics more and more as a visual contribution to make scientific discoveries more clear so that reader does not need to read the text to understand the information. Thus the science section of the paper acts as a natural type of artistic expression.

1. From linear to surficial: a change in perspective

With alphabetic writing, for ages the western world came to understand the universe as a line that surrounds man and projects the world through a series of successions. Over the years, for most people, the line contributed to the process of understanding the world, while

thinking about things as surfaces was relegated to a second plane. Here, the surface, or image, was considered as an illustration of the word or line.

With the reclassification of traditional molds, more value came to be given to organizing the world surficially, in a movement in which the surface came to incorporate the line. These surfaces are the screens of television and the cinema, the flat screen of the computer, for example: a way to represent the world by means of dynamic images, not like the static images observed in the linear world. For Bettetini (1993, p.65), infographics "refers to the production of synthetic images, by means of a computer, that are the product of digital designs rules by logical/mathematic procedures"[2] (*our translation*), which can be the surficial model.

In the debate about the linear or surficial world, the discussion about the form of reading of each organization becomes important. Apparently linear reading imposes a certain linear state, as Flusser (2007, p. 104) states, "we follow the line of a text from left to right, change lines from top to bottom, and turn pages from right to left"[3] (*our translation*). However, what more precisely describe linear reading is the fact that in order to reformulate the message, we must follow the text, follow a path. Surface reading, on the other hand, assumes freedom to choose the path to be followed. According to Flusser (2007, p. 105), in painting, an example of surficiallity, "(...) we can get the message first and then deconstruct it"[4] (*our translation*).

Understanding the specific details of surficial reading is important since science articles have infographics and therefore permit and stimulate non-linear reading. In terms of the mass media, it can be stated that it is becoming more and more focused on the image and reading of images is important for comprehension of the content being reported. Infographics have gained space in these publications and as Barthes (1990, p. 20) tells us, today "the image does not clarify the word or make it more real; it is the word that has come to sublimate, banalize, or rationalize the image"[5] (*our translation*) for the non-specialist[6] of the vehicle of communication.

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[2] Refere-se à produção, por meio de computador, de imagens sintéticas, que, aliás, são fruto de elaborações digitais regidas por procedimentos lógico-matemáticos.
[3] Seguimos a linha de um texto da esquerda para a direita, mudamos de linha de cima para baixo, e viramos as páginas da direita para a esquerda.
[4] (...) podemos apreender a mensagem primeiro e depois tentar decompô-la.
[5] A imagem não vem esclarecer ou 'realizar' a palavra; é a palavra que vem sublimar, patetizar ou racionalizar a imagem.
[6] The research on demographics of non-specialists that read the *Health and Well-being* section of *Folha.com* has not been concluded. The *Folha de São Paulo* site gives access to its own demographic study that offers an X-ray of the readership. The majority of readers are women (51%), they have an average age of 47, are married (59%),

In short, vehicles of mass communication have come to use the image because they understood that the image is a message. Thus our attention is brought back to the images that are part of science articles, that is, infographics. The matrices that make up these infographics in science news texts will be also analysed in order to understand the image as having meanings that are polysemous and rich in character.

2. Infographic as an example of hybridism of the verbal and visual matrices

Pablos *apud* Schmitt (2006) attributed two meanings to the word infographic: one derived from computer software, the root info referring to information and graphic meaning animation; and the other related to humanity's desire to establish better communication in which info means information and graphic means analogical support. For Módolo (2007), the term infographic reassembles the expression "informational graphics" and is an attempt to identify the phenomenon that ties text and image. While for Schimtt (2006), infographics comes from the binomial image + text (bl+T) to pass on facts or incidence.

Independent of the different meanings of the term, infographics can be described as a hybrid form of communication since it employs more than one information matrix: the verbal matrix, made up of words and sentences; the visual matrix, made up of images and graphic representations; and in the case of interactive infographics, the sound matrix.

The verbal matrix drinks from glass of the visual matrix, since the former absorbs all of the other languages observed, and interactive infographics cross the visual with sound. However, according to Santaella (2005, p. 373), the inversion of these relations can also take place because "the language and thought matrices are not exclusive. On the contrary, they act as intercommunicating vessels in a permanent exchange of resources and incessant transmutations"[7] (*our translation*). Infographics allow the thinking that languages are not watertight and since infographics are part of a hypermedia, they can be acknowledged that different languages can coexist.

Since it has been said that infographics are a result of matrices, it is important to be conscious that Santaella (2005) postulates that sonority is mostly a question of being first, of the iconic quali-sign; visuality is mainly a question of a being second, of the indicial sin-sign;

have children (65%), have higher education (72%), and live in the city of São Paulo. The data obtained up to now are not able to define the non-specialist public that reads the Health and Well-being section.

[7] As três matrizes da linguagem e pensamento não são excludentes. Ao contrário, comportam-se como vasos intercomunicantes, num intercâmbio permanente de recursos e em transmutações incessantes.

and being third, of the symbolic legi-sign. Also according to Santaella (2005), the visual matrix, because it comes second among figurative manifestations, corresponds to the first position of the verbal matrix. The visual level of the second position leads to understanding the level of the first position of the verbal, just as the level of the third position of sound helps to understand the level of the second position of the verbal and vice versa.

Establishing a bridge between Flusser's principles (2007) and the propositions of Santaella (2005), the infographic is in the field of images as a visual representation and in the field of representation of what takes place in our minds. It must not be forgotten that the term "representation" is used to refer to signs, symbols, images, and various other forms of substitution, just as representation can be an introduction of an object to someone that will interpret the information.

3. Image in scientific news: the importance of the use of the infographic

We see today that modern life is increasingly dependent on scientific development and therefore scientific news is needed. The communication or broadcast of information about science is a process by which scientific and/or technological information and concepts are directed to the general public made up of both scientific specialists and laymen. According to Capozoli (2002, p. 121), "the term *vulgarization* is not used in a pejorative sense, but as scientific divulgation, as the act of informing the public about scientific advances"[8] (*our translation*).

With the growing need to include scientific knowledge in peoples' lives, the science news story spread on the radio and television, in magazines and newspapers, and on the internet has gotten more and more recognition because it offers the layman (non-specialist) an opportunity to acquire technical or scientific knowledge.

Almeida (2002) states:

> The well-implemented vulgarization[9] of the scientific has the true goal more of clarifying than teaching in great detail regarding a particular point. It constantly keeps the majority of intelligences in contact with science, and has come to create a more receptive spiritual state that is more apt to understand. It spreads scientific

[8] Science news is nothing other than an effort toward intelligibility of the world that is sought and at the same time shared with others.
[9] The term *vulgarization* is not used in a pejorative sense, but as scientific divulgation, as the act of informing the public about scientific advances.

> knowledge more in order to prepare a collective mentality than really to teach specific knowledge[10]. (ALMEIDA, 2002, p. 69, *our translation*)

In the science news articles, one can note the presence of the scientific communicator or journalist whose mission is to make a bridge between science and the generic lay public. This communicator must hold attention to be well-informed and remember that informing is not just summarizing information. For Capozoli (2002, p. 122), "the challenge of the communicator is to forge syntheses, a task that takes a lot of effort and determination, and something that, through an unjustifiable constraint, is almost left unsaid: love of knowledge"[11] (*our translation*).

One of the ways science journalists have found to reformulate scientific knowledge from the social, cultural, and ideological variables, and transmit them to the general public is to present an illustration along with the text: the infographic. Beginning with the use of infographics, the journalist democratizes scientific knowledge and consequently reduces the gap between the specialists, technical and scientific knowledge holders, and non-specialists, people with day-to-day knowledge. For the science story and images, Casalmiglia (1997, p. 16) states that "the text becomes an open and heterogeneous entity that allows association of content with themes from general life and works along with images, photographs, drawings, infographics, tables, illustrations, or graphs"[12] (*our translation*).

In science news articles, the infographic is a tool that can quickly show, explain, and describe hard-to-understand scientific phenomenon to the layman in an intentionally attractive way. According to Calvo Hernando (1997), infographics can show surgical operations, injuries, organs, as well as causes, phases, and forms of a specific event such as diseases, natural phenomenon, and accidents. Like verbal language, the infographic makes the discourse of science less hermetic and thereby more accessible, offering a more general view of events as well as analyzing information that may be less familiar to the general public.

With access to science and technology information through infographics, the public would not have such negative impressions of recent discoveries and could benefit from acquiring scientific knowledge, and significant social changes besides the scientist could also

[10] A vulgarização da científica bem conduzida tem, pois, por fim real, mais esclarecer do que instruir minuciosamente sobre esse ou aquele ponto particular. Mantendo constantemente a maioria das inteligências em contato com a ciência, ela virá criar um estado de espírito mais receptivo e mais apto a compreender. Essa divulgação científica destina-se mais a preparar uma mentalidade coletiva, do que realmente difundir conhecimentos isolados.

[11] O desafio do divulgador é forjar sínteses, tarefa que exige esforço, determinação e algo que, por um constrangimento injustificável, quase não se diz: amor ao conhecimento.

[12] O texto se transforma numa entidade aberta e heterogênea com possibilidade de associar seu conteúdo com temas da vida geral e de combinar-se com imagens, fotografias, desenhos, infografias, tabelas, ilustrações ou quadros.

be encouraged. Cataldi (2007) states that science news helps to improve understanding of scientific facts and to stimulate people's participation in social changes brought on by technological advances. Dissemination of information about science thus acts by bringing scientific and technological discoveries to light, allowing the communicator to use this information to reflect about their reality and act as an active citizen.

These reflections about infographics and their importance to scientific journalism lead to thinking more clearly about the object being studied. The arguments converge in order to investigate the use of infographics in science articles on the *Folha.com* website and the way the infographics carry meaning.

4. Method

The case study has a qualitative character, since it does not seek to enumerate or measure events nor employ statistic instruments to analyze data. On the contrary, the intention of the study is to describe the object analyzed in the context of the site *Folha.com* at a specific place and time. The intention of the study is to provide a description of the object in question from contact with different scientific news texts published in the *Health and Well-being* section of *Folha.com* in November and December 2011. Because of limits of space and time, two texts were chosen for the discussion: *Larynx cancer treatment changes the patient's voice* and *Understanding how a C-Section is performed*. The intention is to see how the infographics are presented in the texts analyzed.

For the procedure, first the literature was surveyed for works that would help establish a conceptual map of infographics, hybridization of languages, change is perspective from linear to surficial, and the role of science reporting. Next a search was undertaken for science news articles that used infographics. The site observed was that of *Folha de São Paulo*: *Folha.com*, because it is a reference in the use of infographics in health and science articles. Finally, a synthesis was made of the graphics based on observation, without using a serious statistical method.

5. Infographics on Folha: an analysis

The *Folha de São Paulo* site initially appeared in 1995 with the name *Folha Online*. Today it is known as *Folha.com*. It publishes around 500 articles per day. According to the

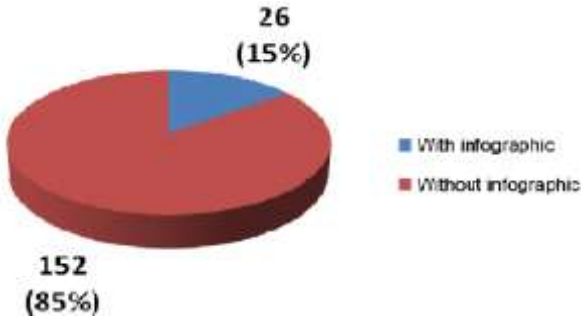
Folha homepage, the mission of this vehicle of mass communication is to produce internet content with the same quality as print journalism, following the editorial principles adopted by the paper: pluralism, independence, and critical and independent journalism.

The *Folha de São Paulo* newspaper, just like the majority of vehicles of communication, in the seventies already began to build up an art department and hire professionals who could create graphics and maps. However, it was in the 1980s that the concept and consequently the word infographics came to be a daily part of articles in the paper. *Folha* was the first Brazilian newspaper to utilize infographics. It was strongly influenced by the American newspaper *USA Today*. Today the infographics published in *Folha* in print and online show the public the process, detail, materials, results, and techniques related to the objective of a journalistic story.

Two articles published in the *Health and Well-being* section of the *Folha.com* site were used for the observations. The paper has a large circulation in Brazil. The site has a variety of articles on anthropology, genetics, meteorology, biology and bioethics, epidemiology, medicine, and health. Articles from the latter were chosen because they are subjects that are often far from the reality of the reading public. In order to restrict the discoveries of medicine and health, the communicator needs to "translate" the typical information of this area for the reader by means of an infographic. Thus the work of the science reporter is similar to a translator of languages.

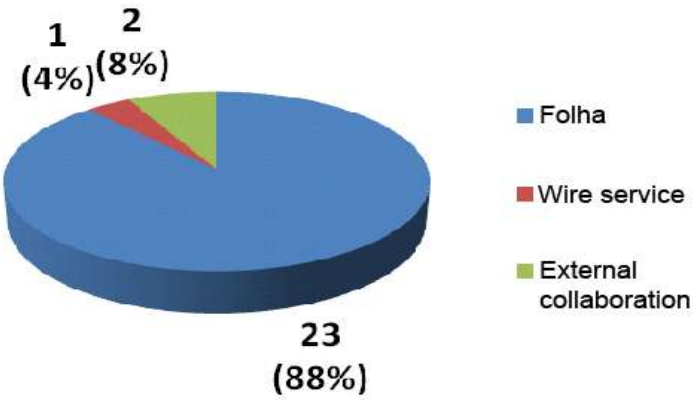
The study observed articles published for a month (from November to December 2011). Note that some of the articles published in *Folha* did not have graphics since they were articles from news wire services and the few that had infographics were produced by *Folha.com* journalists or where the product of collaboration.

Graph 1 shows the percentages of use of infographics in the *Folha.com* articles.



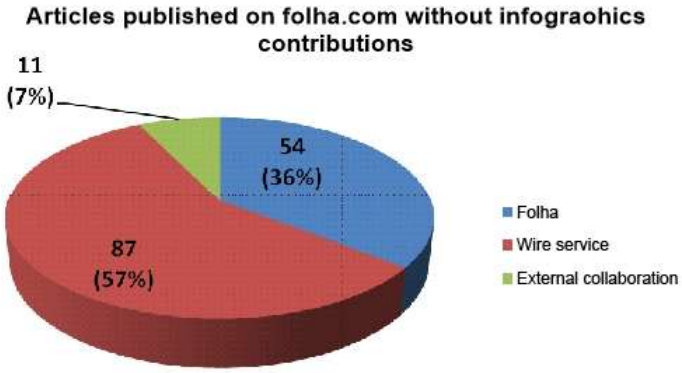
Graph 1: Texts with and without infographics in the months of November and December 2011. Developed by the authoress based on data from the site: http://www1.folha.uol.com.br/equilibrioesaude.

Graph 2 shows the science articles published on the *Folha.com* website which used infographics



Graph 2: Articles published on Folha.com between the months of November and December 2011 with infographics. Developed by the authoress based on data from the site: http://www1.folha.uol.com.br/equilibrioesaude.

Graph 3 shows science articles published on *Folha.com* without infographics.



Graph 3: Articles published on Folha.com between November and December 2011 without infographics. Developed by the authoress based on information from the site: http://www1.folha.uol.com.br/equilibrioesaude.

Because there was limited space for the discussion of the specifics of each story, two were chosen for analysis (Table 1). Note specifically that the articles had infographics that cannot be considered as illustrations of the text, contain information that was not part of the verbal part of the story, and was autonomous from the context of publication.

Table 1 below contains information about the texts analyzed.

Title	**Communicator**	**Date of publication**	**Source**
Treatment for larynx cancer affects patients' voices	Mariana Pastore	7 November 2011	*Folha.com*
Understanding how a C-section is performed	No credit is given.	20 Novemebr 2011	*Folha.com*

Developed by the authoress based on information from the site: http://www1.folha.uol.com.br/equilibrioesaude.

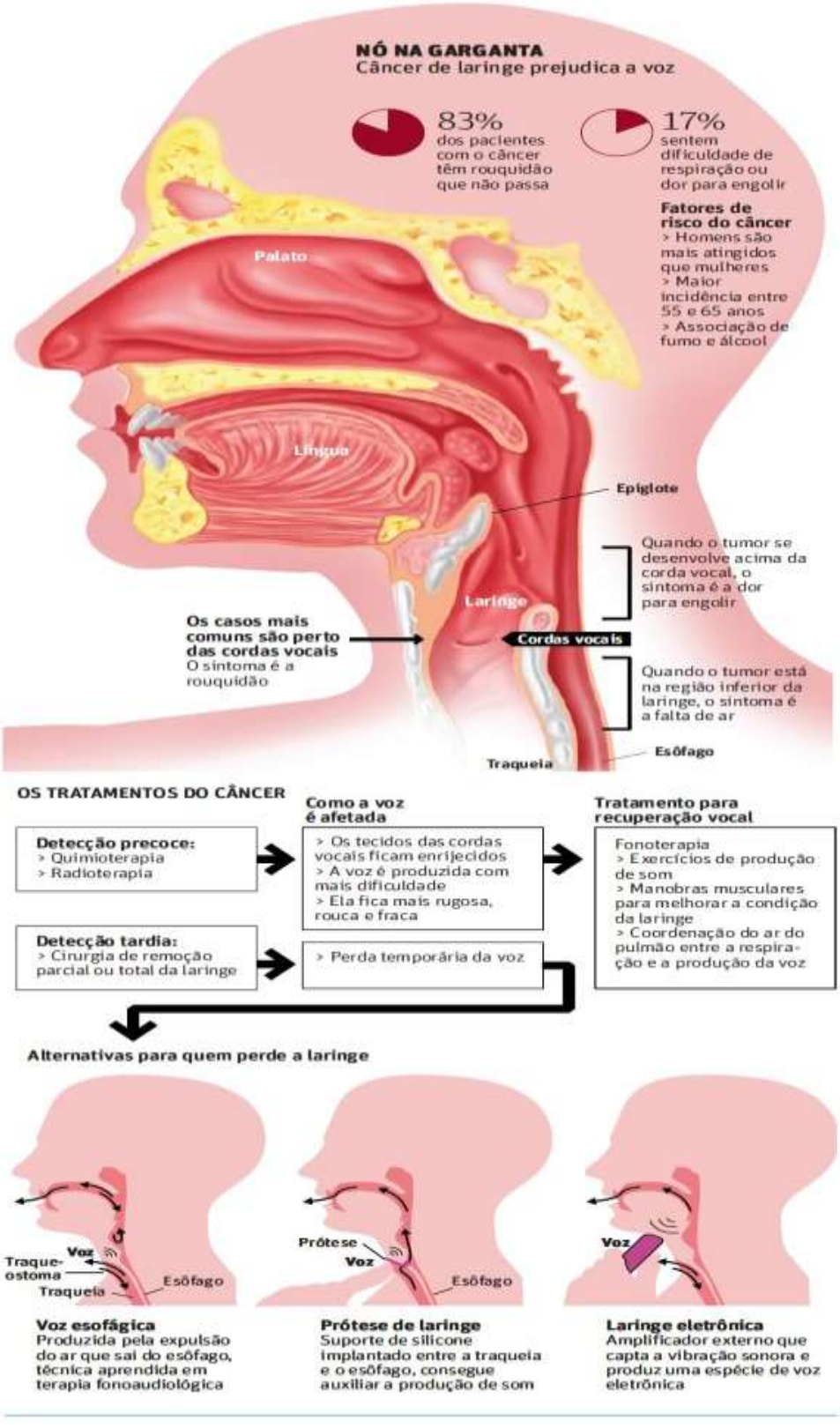
The infographics published on *Folha.com* are an example of how the image is a mediator between man and the objective world and as Flusser (2007) stated, infographics imagine the object that they intend to reveal. Like a compass, infographics orient the reader, since the individual cannot orient himself without creating an image of the world he lives in. This is the situation with science infographics. In order to make it possible for the non-specialist to orient himself, the communicator creates the images so that the reader can understand scientific discoveries.

5.1. *Larynx cancer treatment affects patients' voices*

In *Larynx cancer treatment affects patients' voices*, the main focus are the consequences of the treatments for patients that are fighting larynx cancer, mainly men, who are the main victims of the disease. It is shown that medicines used in the treatment enrich the tissues in the vocal cords and speech therapy is one way that has been found to try to minimize the impacts of the treatment.

The infographic shows a drawing of a human head with the organs and possible consequences of cancer treatment, such as loss of the larynx. The graphic also gives information about the symptoms of the disease and the treatment (Figure 1).

Figure 1: Knot in the throat. Infographic "Larynx cancer treatment affects patients' voices"



Source: http://www1.folha.uol.com.br/equilibrioesaude/1002912-tratamento-para-cancer-de-laringe-afeta-voz-dos-pacientes.shtml

When the material in question is created, the communicator brings the infographic into sight, a type of image that tries to show exactly where all of the real elements of the human body are, in detail. As Schmitt (2006) states, these images may or may not have informative text and numbers. In the case of the *Folha.com* story, there is a caption that gives information about the vocal cords, the most common location of the cancer, and its symptoms.

The infographic from the story *Larynx cancer treatment affects patients' voices* could also be the collective type which aggregates various infographics that could be considered individually, according to Valero Sancho (2001). For Schmitt (2006), the individual infographics that make up the image generally contribute additional information, are smaller, and many times are subordinate to the main infographic. This can be seen in the infographics used in the figure that shows numerical data about disease symptoms, new information that does not appear in the text, such as the risk factors and treatment types.

In the story *Knot in the throat*, the infographic is the result of a complementary relationship between image and word, since the infographic has both image and word components. The image taken without text does not do much to help in the understanding and spread of scientific discoveries. As Santaella (2007) states:

> Messages are arranged so that the visual is capable of transmitting as much information as possible, falling to the verbal to confirm and add specific information that the visual is not capable of transmitting (SANTAELLA, 2007, p. 53, *our translation*)[13].

In this science story, in order to try to shed light on the details of phenomena related to the function of the human body facing larynx cancer and the reactions of the body to the procedures that treat the disease, the creator of the infographic or journalist used colors and textures similar to human organs. The visual matrix attracts the eye of the reader and mediates between man and the world of science that before seeing the infographic would be inaccessible to the individual.

[13] As mensagens são organizadas de modo que o visual seja capaz de transmitir tanta informação quanto lhe é possível, cabendo ao verbal confirmar informações que já passaram visualmente e acrescentar informações específicas que o visual não é capaz de transmitir.

Regarding visual appeal and use of colors, Flusser (2007, p. 128) states that "we are surrounded by colors that have meaning; we are programmed by colors that are an aspect of the world that we live in"[14] (*our translation*). The colors used in the infographic represent the way that surfaces are placed and make the infographic a powerful tool full of meaning.

Relating to the informative text, infographics represent a change in the way of reading information about science and technology to begin a more encompassing manner of reading. Since the *Knot in the throat* infographic was part of the *Larynx cancer treatment affects patients' voices* story, the reader can get a general view of the information in addition to being able to choose a form of reading that does not necessarily begin with verbal text.

The use of infographics in science articles in the *Health and Well-being* section shows that simple and interesting language is not enough, but that extra-linguistic resources are required such as photos, maps, and diagrams. These articles can describe, display, and explain hard-to-understand scientific information. In his studies, Ribas *apud* Schmitt (2006) states that the purpose of the infographic is to facilitate communication, increasing potential comprehension by the readers, and give details about hard-to-understand information.

5.2. *Understanding how a C-section is performed*

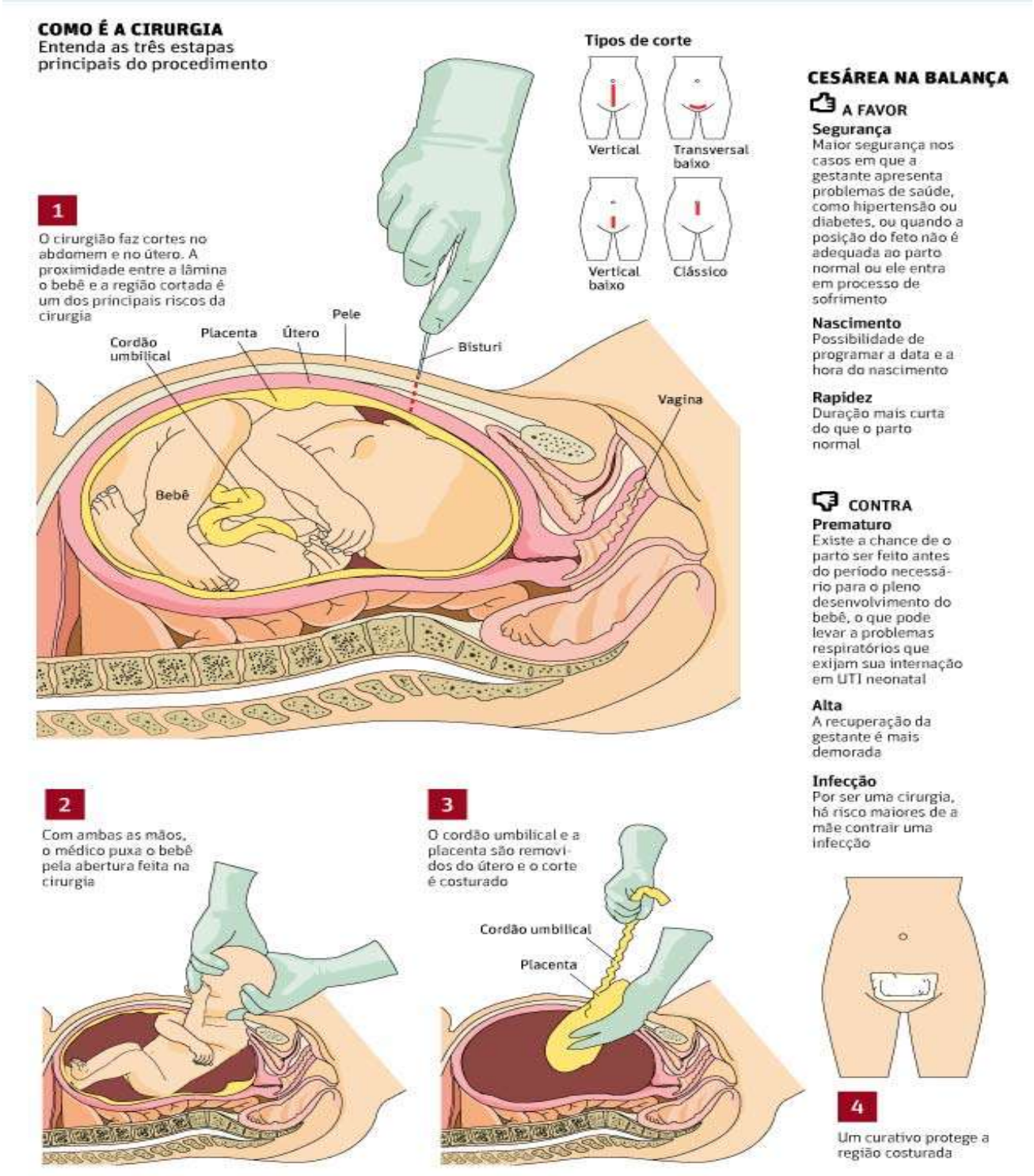
This article makes a very interesting case, since science communication takes mostly on the following infographics. In this material, the first four steps taken in cesarean surgeries are didactically displayed, bringing science communication discourse close to didactic discourse. (Un)favorable points in cesarean surgeries are also displayed. Drawing back on Nichani and Rajamanickan's (2003) framework, one can see that the infographics displayed in the article *Understanding how a C-section is performed* is of the instructive type, as it explains step by step how the surgery is acted and performed, allowing readers to understand the several stages of delivery all in a sequence. The science communicator performs a visual "histological cut" as a way to depict the human inner body.

The image, which is also an instance of the infographics, is an accurate simulation the pregnant woman's body in the midst of a cesarean delivery, putting on a colorful display of the way human organs are located. In this sense, the infographics lead us to reflect that, according to Flusser (2007):

[14] Somos envolvidos por cores dotadas de significados; somos programados por cores, que são um aspecto do mundo em que vivemos.

> (...) as images become more technically perfect, they become richer and better able to substitute facts that they are created to represent. As a consequence, the facts stop being necessary and the images begin to support themselves. (FLUSSER, 2007, p. 116, *our translation*) [15]

Figure 2: Understanding how the C-section is performed. Infographic Understanding how the C-section is performed



[15] (...) quanto mais tecnicamente perfeitas vão se tornando as imagens, tanto mais ricas elas ficam e melhor se deixam substituir pelos fatos que em sua origem deveriam representar. Em consequência, os fatos deixam de ser necessários, as imagens passam a se sustentar por si mesmas.

Source: http://www1.folha.uol.com.br/equilibrioe saude/1009195-entenda-como-e-feita-a-cesarea.shtml

This infographic deals with a case in which the image itself is the story, since there is no verbal text to support it, just the publication of the infographic. The infographic *Understanding how the C-section is performed* is a case of the objective message that substitutes long and inefficient hermetic texts (Figure 2). This practice is common in the type of story that presents complex technical information to the reader who is a layman in science.

Supporting Flusser (2007), it can be stated that this message is autonomous since it has the elements of a news story without requiring a parallel verbal text. The infographic being analyzed is, according to Schmitt (2006), an independent informative unit: it is the story itself. However, even though figure 2 is an independent infographic, since there is no supporting text, it is worth remembering that linguistic resources contribute to the understanding of the information of the message. Barthes (1964) states that:

> Where there is a visual substance, for example, its meaning is confirmed by the fact that it is copied by a visual message so that at least one part of the iconic message is redundant or makes use of a language system. (BARTHES, 1964, p. 10, *our translation*)[16]

The infographic from the story *Understanding how a C-section is performed* works as a sign that leads the reader of the science story to some applicable cognition or thought about an object. In this case, the infographic plays the role of a representation in the sense that it reproduces something that somehow is present in human consciousness, Cesarean-type births. For Goodman (1968, p.17), "the fact is that for an image to represent an object, it must be a symbol, substitute it, and be related to it".[17]

The infographic allows us to see how man is capable of creating images for himself and others and makes man express the subjectivity and imagination of the person that makes the infographics. According to Flusser (2007, p. 163), "the imagination is the singular capacity of distancing the world from objects and withdrawing into one's own subjectivity, and the capacity of becoming part of an objective world"[18] (*our translation*). However, the same author states that imagination is not enough to create images.

[16] Onde existe uma substância visual, por exemplo, seu significado é confirmado pelo fato de que ele é duplicado por uma mensagem visual de tal forma que, no mínimo, uma parte da mensagem icônica seja redundante ou aproveitada de um sistema linguístico.
[17] The fact is that for an image to represent an object, it must be a symbol, substitute it, and be related to it.
[18] A imaginação é a singular capacidade de distanciamento do mundo dos objetos e de recuo para a subjetividade própria, é a capacidade de se tornar sujeito de um mundo objetivo.

The infographic used serves as an aid for science reporting to fulfill its pedagogic role that is to bring science and technology to the level of the non-specialist public, making the members of the lay community feel more well-informed about the transformations taking place in the world. For Schmitt (2006):

> Infographics applied in science journalism are most often able to discuss subjects, processes, and theories that could not be fully explained by means of a text or photograph. Because of their didactic character, infographics make the complex simple, the difficult easy, because it unites the advantages of two languages: the verbal and visual. (SCHMITT, 2006, p. 67, *our translation*)[19]

It is in this case that infographics are shown to be a better option in transmitting technological and scientific information, laws, processes, and theories.

Brief conclusions

In newspapers we see that with the use of infographics, there was a textual surrounding of the image and thus the newspaper came to use more bidimensional codes and distance itself from linear codes. The choice of image in a science story especially in the health and science section seems to be moving toward the desires of a society that is becoming busier and busier and that needs dynamic and easy-to-understand information. This mixture of the verbal and the visual seems to cause an interpretive effect of reflection in the reader of the science story because the images encourage attention and motivation, are better at presenting information and making certain learning processes easier to some degree. Since the purpose of science reporting is to divulge technical and scientific discoveries, the images are opportune and allow society's demand for information to be fulfilled, which is the role of the communication genre.

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[19] A infografia aplicada no jornalismo científico, na maioria das vezes, consegue dar conta de conceitos, processos e teorias que não conseguiriam ser explicados totalmente por meio de um texto ou uma fotografia. Por seu caráter didático, a infografia transforma o complexo em simples, o difícil em fácil, pois reúne as vantagens de duas linguagens ao mesmo tempo: a verbal e a visual.

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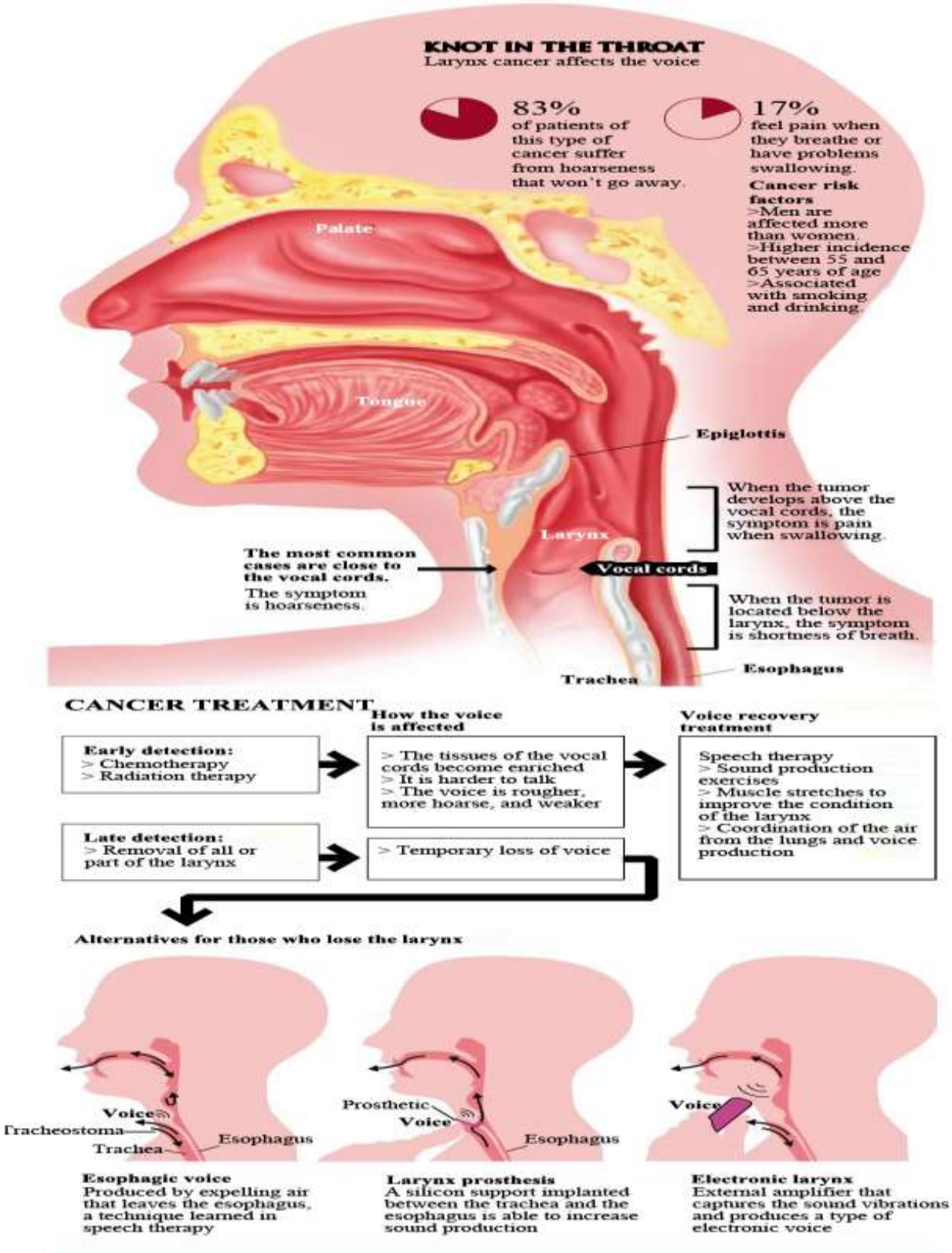
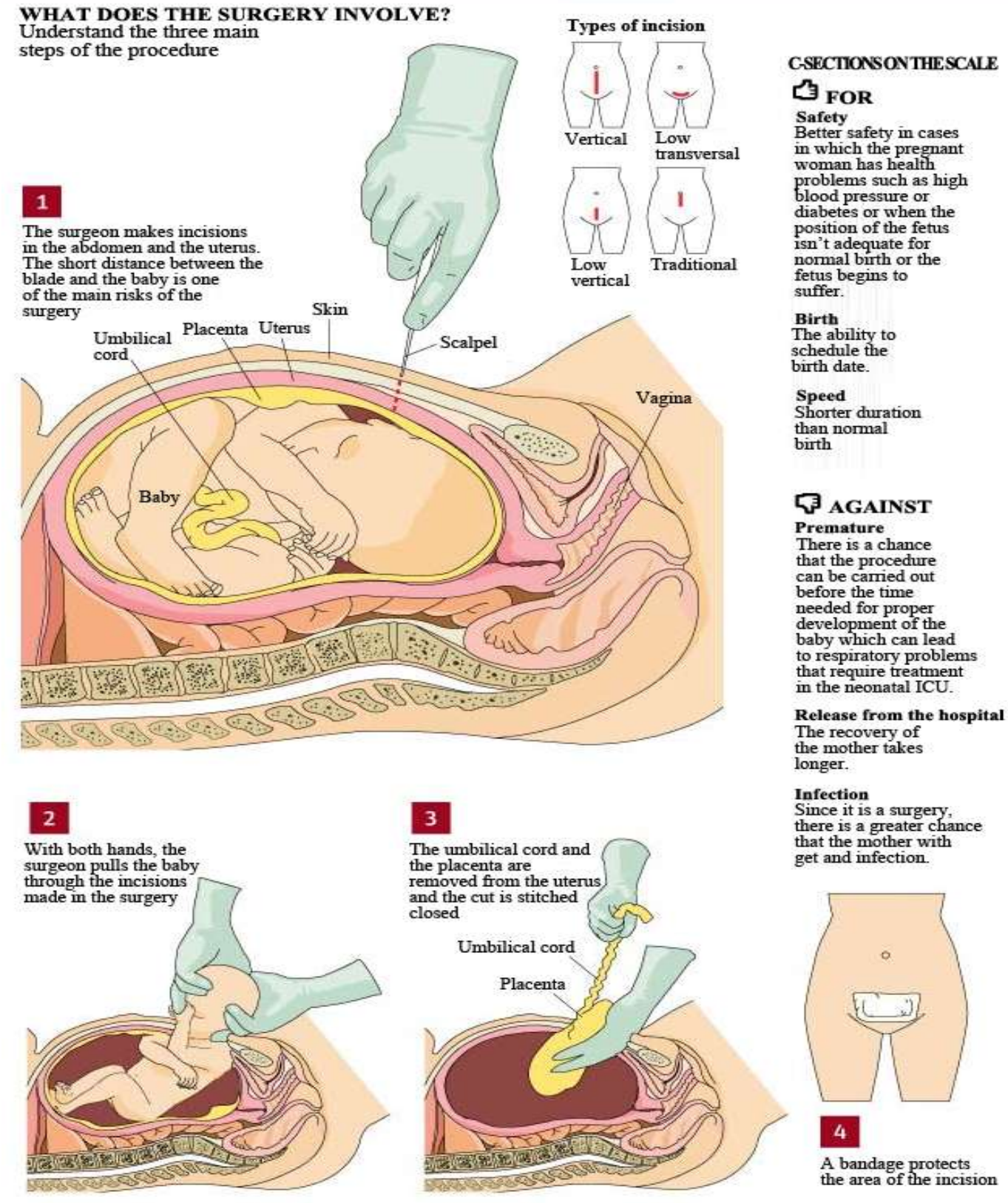


Infographic 1 – translate



Infographic 2 – translate