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Competitive Intelligence in Health: An Analysis of the Big Data for Rescuing the Neglect of the Neglected Diseases on Last Century

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Abstract This paper aims to demonstrate the growing amount of information's data in the world. A case study on public health it was used taking as an example the neglected disease dengue. The globalization of markets in the XXI century have major changes in the knowledge era. Data information of this new generation provides numbers reach unprecedented in human history. In this sense, new forms of analysis have appeared in order to use the concept of information science that has long existed. With Big Data becomes pressing new approaches and treating in competitive intelligence. So, when using Web 2.0 tools its possible results that are more effective. In the field of public health is no different. To supporting the rescue of the theme "neglected" of the last century, there needs formation of multidisciplinary networks to fight against the issue. Therefore, it is essential combination new methods of analysis for decision support system due the Big Data era. Essential information is of great value to innovation and technological development for any country. Thus, through of the data mining in patents, curriculum database and scientific papers is can be shown the presence of Big Data on health. In this sense, results shows that approach using technology forecasting and consulting databases indexed such as PubMed, Web of Science and Lattes database are rescued a large volume of data, once made the correct mining of them it is possible to get essential data to aid in decision making.

Keywords: *Big data, competitive intelligence, science information, health public, dengue*

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1. Introduction

According to the Organization for Economic Cooperation and Development (OECD), 55% of the world's wealth is in knowledge. Drucker (2000) points to the increased production of this knowledge will occur with increasing knowledge management. New trends affect the industrial development of the country, such as knowledge of competitive intelligence as the primary resource and learning as the central process. Therefore, it is essential to broaden the base of expertise in human resources and thus increase more innovation potential [1,2].

The information-produced knowledge is general considered a condition of survival, since it expands its communication context with the story of rescuing the preservation of social memory. Thus, its value becomes immaterial and resists all mechanisms of oblivion and destruction, since the collection of information allows the cognitive reconstruction and knowledge of the reality in question examined. In this sense, the continuity of the information may indicate the result of the human capacity to act together and pursue a common policy for the political transformation of society [3].

Thereby, decisions makers without access to adequate information leads to wrong decisions and sometimes disastrous. Decisions based on facts and reliable information is more likely to produce good results and provides policy makers with grants to meet the challenges of everyday life as well. Appropriate and timely information, develop effective strategies and acts proactively. This can be known as a competitive strategy when it comes to business approach, which maximizes the value of the capacity of the organization to distinguish the company from its competitors [4].

Intellectual capital (human resources, intellectual property, etc.) is the most important role in the business economy. Thus, knowledge is the key for competitiveness and economic development of the nation, in the same way for high-tech industries as well as the health care sector. In this sense, the amount of data in the world has exploded and analysis of large data sets, called Big date. According to a study conducted by McKinsey's Business Technology

Office, these data will become a key basis of competition, underpinning new waves of productivity growth, innovation, and consumer surplus. Leaders from all sectors will face the consequences of big data, not just data-oriented managers. The increase in the volume increase and detail of information captured by enterprises, the rise of multimedia, social media and the Internet of Things will fuel exponential growth in data for the foreseeable future [5,6].

Every day are create 2.5 trillion bytes of data. This data comes from everywhere: from sensors used to gather climate information, posts to social media sites, digital pictures and videos, purchase transaction records, cell phone, GPS signals etc [7].

The amount of data in the world has exploded. Companies capture trillions of bytes of information about their customers, suppliers, and operations, and millions of networked sensors are integrated into the physical world in devices such as mobile phones and automobiles, sensing, creation and data communication [8].

Thus, because of the range of existing raw data it is necessary improve analysis and simplify them within a clear plan and strategic representation. Therefore, providing an analysis of the decision that extends to all areas of health[9]. According Wikipedia Miner, 43% of "Big Data" termare relates to the term "health" in Wikipedia [1]. Public health problem are enormous and require a multidisciplinary staff. Thus, they need a better management of the information in the "knowledge age" and Technology [7,10,11]. In this sense, must consider all positions about culture and collaboration of Research, Development and innovation (R&D&I) through collaborative networks for the dissemination of knowledge. Since the processes involves R&D&I drugs are each day larger because of the complex data (Big Data), becomes necessary multidisciplinary teams to create a systemic vision [12,13].

This quantity of data published daily leads to the constant training of professionals in all fields, such as "scientific data" - one who constantly seeks the best way to deal with the phenomenon of Big Data. Scientific community consolidated this term due to the need cope with the continuous accumulation of data that are structured and are captured from various sources for technological solutions. They are in order of petabytes, or quadrillion bytes of data stored. Thus, it is difficult to address these issues both to conduct scientific projects and businesses or any other type of business organization [8].

In addition, we note that the data intensive science is not new, but the scale on which they have any type of issue and, in turn, correlate worldwide are increasing need new tools to extraction, processing and analysis. Thus, information science was a multidisciplinary field that has provided a completely new branch of scientific tools and technologies to analyze the data generated in real time.

On the other hand, it makes it worse situation when combined neglected populations, i.e. those who do not have access to treatment. According to the World Health Organization (WHO), 80% of the world population living in countries with low and middle-income and cannot afford. This situation intensifies when exposed to a neglected disease (who do not have effective or appropriate treatment for Neglected Disease (ND) and not a new drug was discovered more than 50 years) dengue, tuberculosis (TB), malaria etc. These ND affect approximately 1 billion people worldwide [14,15]. For example, a cluster according CarrotLingo3G®, using the term "neglected disease" indicates there are 723,000 documents about this. Due do not possible to analyze this huge amount, the proposed solution was to reduce to 78 groups and then regroup in the top 25. The key dataand correlated with the main subject, see in Figure 1.

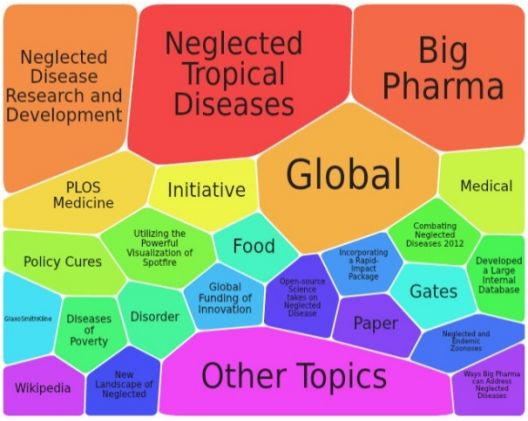

Figure 1. Data mining on neglected diseases group

Note that all data for the topic most relevant and studied (neglected disease)were grouped into new sub-themes and more effective. Thus, the decision maker has an organization where can quickly view critical information subsequently access the documents related to the theme, partnerships, institutions and their work.

In another analysis, whereas the overall analysis of the disease dengue regarding the amount of the global outbreak, warnings and international importance. Figure 2 shows a real-time monitoring of the state of disease on the public health threat to humanity.

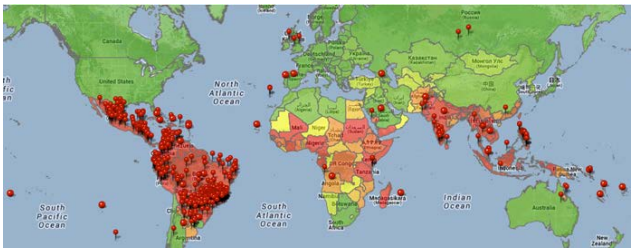

Figure 2. Overview of global alerts about dengue (http://healthmap.org/ Access 01.03.2014)

The data presented by "HealthMap" are interactive and they can gather information from more than 100 diseases that were most commented published in a given period (day, week or month). WHO has a list of priorities disease to monitor, so the *HealthMap* use this data for analyze the global map of the diseases. This processing use the search engines linked with scientific databases, reports, etc. It is worth noting the larger the circle, the more "alerts" generated a particular disease. Then it is possible to click on each to redeem their documents and the area in question as possible "warning". This tool was effective when the epidemic in many parts of the H1N1 flu, allowing to obtain quickly outbreaks and so aid public authorities to take effective action to control and prevent a

[1]Is a toolkit to exploit rich semantic encoded in Wikipedia. Wikipedia Miner running locally involves downloading and processing the huge amount of information.

global pandemic. Whereas the traditional measures of medical reports and analyzes of public health would take months for an intervention in this case monitoring "in time" provides a revolution in the field of prevention and public health [13].

Identify and analyze Big Data in the amount of scientific information and international networks of respective relations can be an aid advancement of science and possibilities of rescue care in ND for the new century. Therefore, this article uses Web 2.0 tools to illustrate the existence of Big Data in science (Public Health). Dengue fever is the disease was chosen because it is considered one of the ND - an area in which, for decades, been neglected by the pharmaceutical industry (does not generate profits) in their R&D&I for new drugs and medicines.

This work does not presume to introduce new indicators, but to demonstrate for non-specialists the possibility to use the Web 2.0 how a tool for aid to work through Big data, particularly with public health. In this case, the ND dengue.

2. Methodology

This study involves Big Data and Web 2.0 tools. Data are extracted using data mining after consulting databases available on the Web 2.0. The extraction and processing of data using Application Programming Interface (API) to enable data on computer programs, since the amount of robust download information. Thus, by making use of tools information science, such as technology foresight, it was possible to use any of the API route and explore the potential of the web. The references are obtain from databases such as Science Direct, PubMed and Scopus database, Institute for Scientific Information (ISI). Scenario for dengue, was searched the word "dengue" in the software "engineering research" on Healthmap™ and GoPubMed™. In the same way to identify key experts working in dengue disease using Bibliometrics to extract all the scientists in scientific dengue programs in the CV of the Brazilian Lattes database. Software used was ScriptLattes© and the criteria considered was expert in the field of dengue and to have a PhD degree and be connected with a research group on dengue affined contributions to national and international research networks.

3. Discussion and Results

3.1. Information on Competitive Intelligence and Web 2.0

21st century is characterized as the era of knowledge. Intellectual capital has played an important role in the economy and business knowledge increasingly as a key driver of competitiveness and therefore the economic development of the technology. This occurs mainly in areas that require high density technology where knowledge becomes the most important (pharmaceutical, aerospace, telecommunications, etc.). [1].

Nevertheless, public health issues are huge and require a multidisciplinary work force. Thus, they need better information management and technology "Knowledge Age". Should be as an adaptation to the actual conditions of each culture and collaboration of Research, Development and Innovation (R&D&I) through collaborative networks for the dissemination of knowledge through local development and innovation. Working with information science any field of application includes a highly structured network [12]. Once the processes involved in the R&D&I drugs are increasingly complex, it is necessary to form multidisciplinary teams to establish a systemic vision.

There are differences between Knowledge Management (KM) and Competitive Intelligence (CI). At first, both there are designed to provide knowledge and information to the right people at the right time. In many cases, the difference may be a few more points of view. It is a question of how to optimally satisfy a goal or immediate operational requirement [16].

As indicated above, the knowledge of data is essential for the manager of a company or a particular institution. Thus, it can be used as the intellectual property of the individual / society. All well designed and analyzed to help make the right decision in the short or long term, the information can be understood as strategies to gain market share, definition of research and / or long-term vision. This combination results in CI - when critical information is not only used as data information but also as a management tool and can be a competitive weapon in the markets generating significant financial returns.

Therefore, the mission of intelligence professionals and researchers in an organization includes the acquisition, analysis, interpretation and transmission of information to the leaders of the organization. The mission of KM professionals focuses on the identification, classification, organization and provide useful knowledge to the areas of the organization responsible for making decisions, the sector needs analysis and problem solving. The KM takes care to make the resources of existing knowledge within an organization to share; many of them are stored in digital formats. CI is focused on the capture of resources that are both external and internal. However, organizations that work with these two methods, the distinction between the two remains unclear. It is believed that CI and KM go away together [16,17].

Web 2.0 it was a concept created in 2004 at a conference between business and O'Reilly Media Live International. This term coined in front of some existing applications to which they potentiate the exchange of information focused on the user, such as Wikipedia, Facebook, blogs, etc. Web has come to be regard as a platform, but did not involve technological change or update the technical specifications. With this "new look", based on the second generation of the Internet has been the change in attitude of software developers and those who used it, enabling a new way of looking at the concept of Web 2.0 has keyword "interaction". Users are no longer passive in the communication process to become active elements that add value and information. Therefore, we assume the existence of an architecture that is continuously and directly or indirectly to each user participation [18,19].

Thus, the CI tools available on the web to assist in the management of innovation in global health, mainly DN seems to present itself as a good instrument to use for non-

developed countries, as well as further threatened by this disease. In this sense, the collection and use of information by "Application Programming Interface" (API) allows you to data in computer programs with a robust download information effectively utilize the opportunities via the API and, in turn, provide the exploration potential on the Web [20,21].

Can be measure the value of information by different "looks", among them, one can invent patents. Organizing in the information for better analysis in the field of healthcare, patents are essential tools for the industry. In 1994, was signed by members of the World Trade Organization (WTO) Agreement on Aspects of Intellectual Property Rights related (TRIPS) is known as an international agreement administered. This agreement establishes that the entire member countries must granted patents for chemical and pharmaceuticals, where patents in the field has become more intense and controlled in member countries of the WTO. This agreement establish that the production and sale of drugs only can be made by the holder of the patent for a period at least 20 years [22,23]. In this way, preventing the production and marketing of pharmaceutical products for other pharmaceutical companies, but encourages investment in innovation [13].

Therefore, pharmaceutical patents have begun is so important, once that contain novelty and reveal the details of the invention, if process or product. By the other hand, the researchers and / or managers consider patents as an important indicator of innovation. Studies related patent of the company, in particular countries and owners of the invention, can reveal the technological dynamism of a particular industry, and provide information on the direction of technological change. As regards the field of health, the pharmaceutical industry is essential for the R&D&I. This industry is growing every year with nearly $ 1 trillion and projected sales expected to reach 1.2 trillion dollars in 2016 [24,25].

3.2. Information about Big Data

Considering that the revolutionary impact of information on the twenty-first century was not only the origin by "information", but also the advent of "artificial intelligence" or the effect of information science through computational science and thus facilitate decision-making, policy and strategies of organizations. The Internet has been explosive from the main to the worldwide distribution channel for goods, services and employment of professional and managerial work. Besides creating a new economic dimension, quickly replaced by "mental geography" of the population, which makes broaden the horizons of the mind of the common person. This is a brand new, unprecedented and unexpected for world science stage of evolution. In this perspective, the society we live in will change significantly over the coming decades and draw a new business environment [11,26,27].

In this sense, the growth of the information society in the global market has opened up new ways to use a concept that even if there was a long time ago, has evolved as a means of disseminating and processing data. At all ages, a professional contractor has always felt the need to be informed to take decisions to defend their "territory", ie, to compare with other measures the ability to identify, measure and assess. In this sense, the early days of the Internet "without borders" seemed a false revolution, since traditional models of media (television, radio, etc.). Based on vertical communication remained but a fundamentally different model emerged about 240 million sites in June 2009, and since then, has imposed its hegemony [3,28].

The paradigm of horizontal communication, i.e. "many too many" (Web 2.0) is now dedicated and welcomed new uses. As shown in Figure 3, two types of phenomena had appeared at the same time. On the one hand, the vertical communication model (one too many) resulted in a horizontal communication model "many to many (n to n)." This is an extension of collaborative "peer-to-peer "in force in the organization of our societies, where the network established technical architecture for the implementation of the social interaction, the flattening of social relations under the influence of the technical architecture of networks was accompanied by a phenomenon of virtual community [16,19,29,30].

In Figure 3, note all stages about web evolution in 90s.

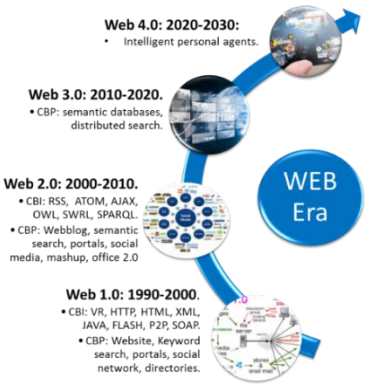

Figure 3. Evolution of the links between the information in the connection between people. Adapted by the authors of the New Spivak (2013)

After more than 20 years, it's observed that the information revolution with Big Data, requires new approaches to look at science and technology and constantly connect large networks established. This is highlight on the absorption capacity of a specific technology country / company. Shown that Brazil began its first Internet connection (NCP protocol to TCP / IP) in 1991 by the Foundation for the Support of Research of the State of Sao Paulo (FAPESP)[2][31].

Despite finding the large volume of data on the Web, it is worth mentioning the existence of two categories of data in the virtual world, the visible Web (water table) and invisible, also known as the deep Web (or deep web dark web). Visible is basically any information obtained by simple standard like google and other search engines as well as Twitter, Facebook and non-dynamic websites. It is estimate that the available data in this category is 4% of what already exists in the entire web, for deep Web are the remaining 96% data, i.e. those that actually be considered more valuable. This procedure in web is not trivial to obtain core data them. So, the information is "buried" in many layers into a dynamic page, which is a vast repository of information that is not available on standard search engines [5,11,31]. For example, websites from

[2]http://www.rfc-editor.org/rfc/rfc801.txt.

companies and other sources they have access allowed only by custom query, as well as registration, license, etc.

Given that exponential growth of data processing Big Data is necessary for the production of knowledge of the intelligence product to provide accurate intelligence, timely, complete and relevant to government leaders, heads business and other policies in their eagerness to support the process of decision making. However, the process of intelligence by its nature is prone to error. The information is open to other interpretations, and the human mind is subject to cognitive bias cultural, organizational and other.

In this context, the complexity arises in information processing, it is necessary to involve people, processes and technology, where people must be train in both a strategic approach and management, search solutions and proposals in addition to operational problems. Namely, managers prepared to manage, make decisions and prepared for technicians analysis to propose alternatives. Already in the process, these involve methodologies, relationships between stages and other results of treatment of large data first. With regard to technology, there are tools, computer systems and Internet connectivity to use. However, the technology may be obsolete over time, and thus the need for constant updating and adapting to new tools [32].

Big Data is not a miracle. Although the range of information in this world are many, the interdependence of people, processes and technology are not implemented effectively (make the decision through a systemic view of the organization in relation to ecosystem inserted), impoverishing every effort to "translate" data "extracted" on an issue. Therefore, tools for analyzing large amounts of data organizations increasingly permeate, because the technology is increasingly the "DNA" of them. It is qualified for use tools effectively and to translate the results.

Currently, Big Data is part of a much larger a whole ecosystem of data analysis software. The company began the era of "internet of things." She left the virtual world of computer screens and is increasingly present in the daily lives of people. You can find chips in mobile phones / smartphones, appliances and cars, allowing them to have the possibility of these devices being connected to the Internet from there, be possible to manage and anticipate many situations of the day -. to - date software to program the refrigerator thaw, check the temperature of the house and to regulate, the best way to manage the house - work and vice versa, make purchases online and receive at home, monitor and issue warnings to the physician and health patients, etc.. These small examples of connections generate a large amount of data. from them it is possible to analyze and understand more accurately the behavior of people and predict situations seeking a better quality of life for rights [19,28,33,34].

Another example of Big Data can invent a situation in the retail market. When a person accesses an online store, your site may take a few milliseconds to identify the purchasing profile of the individual and offer the most relevant products, considering, for example, the various mechanisms (applications, biscuits etc.) People are those automatically installed in the computer's IP through "clicks" when the person is in "surfing" on the Internet.

Thus, the algorithmic processing of Big Data programs can offer products that "enchant" the potential client. Previously, think of this situation in the physical world take months through surveys and other actions. For example, the United States, energy companies have been reading clocks to measure the consumption of the devices individually. Enabled the consumer to verify the trimmings, offering savings on the energy bill when passed disable some devices. On the other hand, the energy companies to identify in real time, how much is consumed in every home, make more accurate and economical system of electricity distribution[3].

A success story related to public health can highlight the interactivity of virtual health services in real time. Portugal has implemented the system with many successful cases where the tests are performing without the patient having to return to the office to get the result, and take him to the doctor. This occurs after the exam results sending electronically to the health service and only contact the patient in case of anomaly. Similarly, doctors prescriptions routed to online pharmacies, the patient simply present their identity in the pharmacy to have it delivered the drugs concerned. The Government of Singapore, this unified its health system in a centralized data management: Medical examinations and consultations of all citizens recording in an electronic medical record that is update in real time. There is even a bonus program. If a patient following treatment to the letter, earn points that translate into tax breaks [5,34,35,36,37].

Big Data is integrated and real into society in all areas, governments and institutions. In addition, the mapping process, i.e., process and disseminate information on behalf of the Company to expand and improve the quality of life becomes a constant challenge, as adopted by the organizational and cultural culture of each country.

3.3. Dengue and Public Health - A View of Big Data and Web 2.0 tools

Dengue is an infectious disease transmitted by mosquitoes *Aedesaegypti* and has four different viruses (DEN-1, DEN-2, DEN-3 and DEN-4). Treatment is symptomatic due to a drug to cure does not exist. It occurs mainly in tropical and subtropical regions of the world, because it is present in almost all tropical regions. Epidemics usually occur in summer, during or immediately after rainy periods. No medicament is discover for this disease yet. Dengue threaten approximately 4 billion people in the world (http://www.plosntds.org/article/info:doi/10.1371/journal.pntd.0001760http:/www.plosntds.org/article/info:doi/10.1371/journal.pntd.0001760)[38].

Therefore, to think about improving the health of the poorest people in the developing world leads to the conclusion of the need to develop and deploy many varieties of innovations in health, including new drugs, vaccines, devices and diagnostics, as well as new engineering techniques and processes, management practices and policies in software systems and health services [39].

[3]www.portaldasaude.pt/; www.scienceineurope.com/; www.ces.uc.pt/publicacoes/oficina/182/182.pdf ; TED Conferencesvideos – www.ted.com/

On the other hand, Big Data cannot ignored. The mining of large volumes of data to better identify high-level skills, networks, given the state of the art pharmaceutical compound and / or shares of the chemical governance are essential to the advancement of science for a better life. However, a major challenge is to adapt to reality 2.0 (collaborative) on a very bureaucratic system of public administration, which, in general, innovation in the field of information technology is extremely faster than actions for change in the system of public health countries.

When looking at the Centers for Disease Control and Prevention (CDC) notes that dengue has become a global problem since the 1950s. With over a third of the population living in the world, in areas at risk for transmission, dengue infection is a major cause of illness and death in the tropics and subtropics. Although dengue rarely occurs in the continental United States, it is endemic to Puerto Rico, and many of the most popular tourist destinations in Latin America and Southeast Asia; periodic outbreaks occur in some countries with a temperate or Mediterranean. CDC in collaboration with HealthMap (http://www.healthmap.org/) observes the real-time monitoring of threats of dengue epidemics, and warning the international importance of dengue from official databases, journals, and other media sources as shown in Figure 4.

Figure 4. Overall map about global alerts in dengue.

Through research engineering, the software processes the data of dengue and displays the result as a map. There are 2,151 alerts dengue between 15/08/13 to 14/02/14. Regarding circles, if too large a more intense color, indicates that the number of alerts is greater for a specific area. In this case, it emphasize more on Central America, Brazil and Southeast Asia.

As a practical example of Big Data in health, to examine only a database of biomedical literature, in this case the PubMed. This database has over 65 million scientific papers since 1953 and has over 23 million citations in health care. On dengue, we identified 11,856 studies. Table 1 shows the total number of publications over the past 20 years and the countries and cities that have acted in dengue. Note the research on dengue has increased by 135% in the first decade and examine the entire period (1994-2013) the growth is about 9 times.

Table 1. Ranking of countries and cities with dengue studies (PubMed - Feb/2014)

Year	Publications	Country TOP 20	Publications	City TOP 20	Publications
2013	1284	EUA	2014	Bangkok	374
2012	1053	Brasil	842	Singapura	323
2011	934	Índia	794	Rio de Janeiro	256
2010	795	Tailândia	575	Kuala Lampur	194
2009	729	França	397	Havana	188
2008	651	Austrália	357	Fort Collins	180
2007	547	Singapura	323	Paris	159
2006	514	Taiwan	322	Betesda	152
2005	428	China	311	Taipei	147
2004	344	Malásia	266	Nova Délhi	146
2003	330	Japão	259	Worcester	117
2002	283	Reino Unido	258	São Paulo	104
2001	246	Cuba	210	Guangzhou	97
2000	238	México	207	Brisbane	94
1999	218	Alemanha	151	Lucknow	93
1998	214	Argentina	114	San Juan	86
1997	182	Colômbia	108	Londres	82
1996	155	Holanda	100	Oxford	78
1995	151	Porto Rico	90	Beijing	78
1994	146	Vietnam	88	Mexico City	78
Total	**9442**	**Total**	**7786**	**Total**	**3026**

Among the 183 countries working on the theme of dengue, 80% of the work undertaken are concentrated in 20 countries described above. He also noted that research in the field of reference of dengue are located mainly in countries outside the tropics - dengue endemic area for the disease. Paris is the only city that is not tropical and located and is among the TOP 10 research centers that host for dengue.

Using Lingo3G CarrotSearch ® software, it is possible to obtain another form of analysis and perspective of Big Data on dengue disease. In a first analysis, the program has requested information on 06 bases (wikipedia, bing, News, images, PubMed etc.) Totaling 3,540,000 documents. After pooling the data for greater relevance of the topic in question, the results focused on 200. Among this universe, it decided to identify the Top 90 most relevant dengue and was rescued 14 specific documents related to the health of dengue. As a result, it observed in Figure 5 grouped by title. Note that it is possible to query and retrieve information by clicking directly on the results.

In an attempt to eliminate interference unscientific results, a new data mining performed in Lingo3G software, but only help the PubMed data. Thus, 11 855 documents were found. This amount has grouped by similarity and relevance. In Figure 6, left side, you may notice already reduced 150 documents interact "dengue" with the theme "disease" results. In the same figure on the right will retrieve 52 specific work on dengue fever.

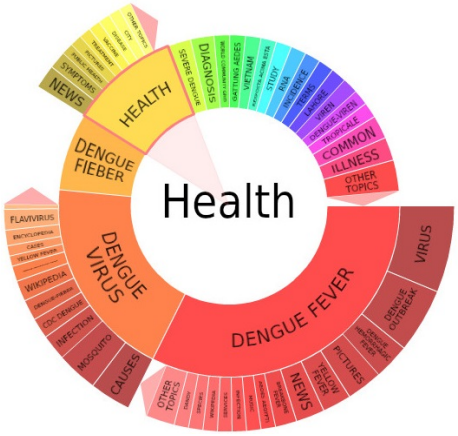

Figure 5. Core research in dengue by Lingo3G software (Fev/2014) data

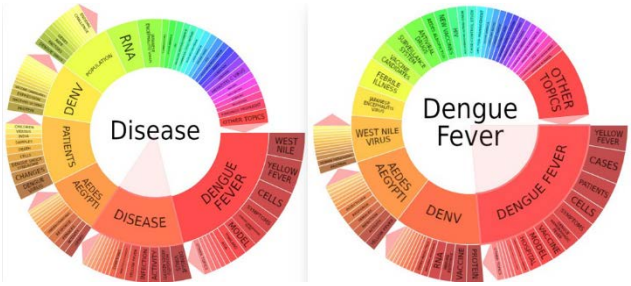

Figure 6. Essential dengue by Lingo3G software data - PubMed (Fev/2014) alone

From another point of view to identify scientific skills (authors) who work in dengue and their research, contact networks, etc. It was used ScriptLattes software to identify, retrieve and process more than 1 million CVs in the Lattes Brazilian database. Consequently, there were identified 15,465 experts in dengue disease. Considering only the Brazilian and foreign scientists (Brazilian and foreign doctors), the number rose to 4,164 (27%), but considering only the experts that are related to "Dengue Research Group", the number that represents the core competence dengue is only 10.2% of the total (424 experts) which can be seen in Figure 7, and their respective networks.

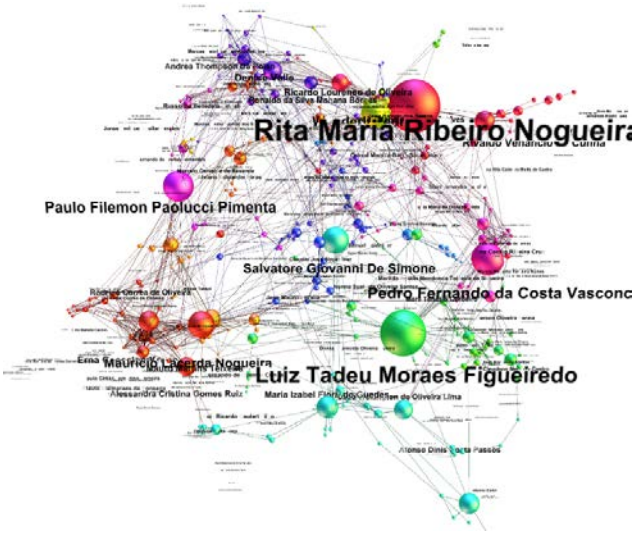

Figure 7. Experts in dengue extracted from basic Lattes databe

Whereas experts who work with these 424 national and international levels, the number of experts in dengue rises to 1,394 experts (33% of total) - see Figure 8.

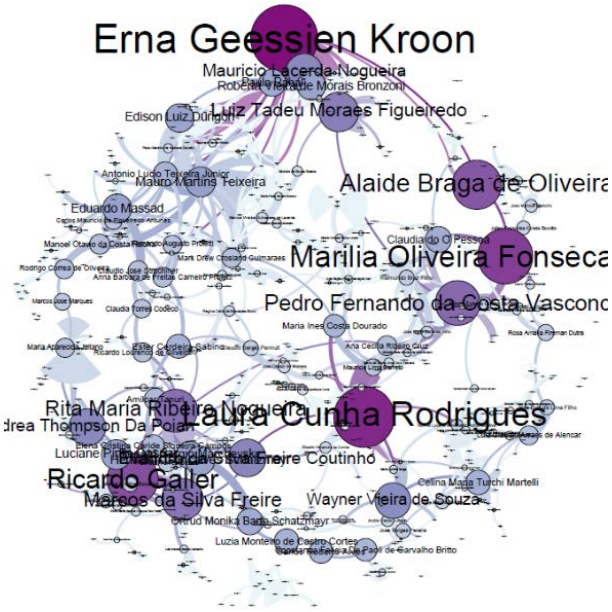

Figure 8. Dengue experts extracts basic Lattes more collaborative network

These scientists are more numerous in Brazil, Europe, and North America. The location it can be saw in Figure 9.

Figure 9. Geolocation map - Dengue Experts

The experts produced 1,394 works, whereas that 49,058 scientific articles, 1,291 books, 775 technology products, etc. We identified 2,332 prospective studies are underway for these experts. These works are the guidelines doctoral and postdoctoral monitoring dengue. The themes illustrated can be saw in "cloud" dispersed of Figure 10. In the pink highlight there are the most relevant guidelines. Assessment, design, development, analysis, evaluation, diagnosis, proteins Brazil, infection etc.

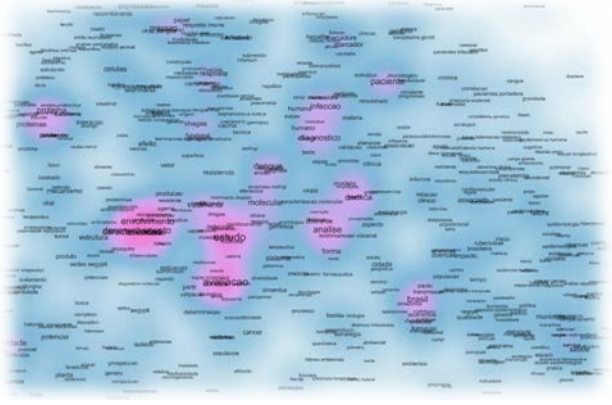

Figure 10. Map geolocation - Experts dengue.

Details of all searches can be viewed http://vlab4u.info/doencas%20negligenciadas/Dengue/.

4. Final Considerations

- Big Data era has been restored with the start of the new millennium and signals exponential progress each year. Thus, advocates of new approaches to the analysis and processing of data in order to provide better information for decision makers in all areas of science.
- Competitive Intelligence 2.0 is the approach demonstrates a practical and affordable tool to assist managers in all fields, especially when there are difficulties in the acquisition of paid software. In the field of public health, particularly in DN, where there is a great lack of interest from the private sector, the Big Data processed with tools for collaboration is a great ally, given that advances in health policy in this area are still many efforts by threatening more than 1 billion people in the world.
- Health is a priority of humanity in search of a better quality of life. Similarly, 2.0 tools can help in the treatment of large volumes of data in the field of health, in particular as regards diseases neglected by decades of investment in R&D&I.
- The intelligence of the organization and, therefore, the treatment of information in times of Bid Data is crucial for the maintenance; advancement and leadership are marketing, scientific research, government policies, etc.
- It was possible to identify prospectively the stage of the disease dengue on a scientific basis and processed by Web 2.0 tools. However, the scenario of research has increased over 300%, a global network of experts and their scientific work and research topics.

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References

[1] Lastres, HMM e Sarita, A, *Informação e Globalização na Era do Conhecimento*. Rio de Janeiro: Editora Campus Ltda., 1999.

[2] P. Drucker, *Desafios Gerenciais para o Século XXI*. Cengage Learning Editores, 2006.

[3] A. L. S. Castro, "O valor da informação: um desafio permanente", *Rev. Ciênc. Inf. São Paulo*, vol. 3, nº 3, 2002.

[4] M. E. Porter, *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. Simon and Schuster, 2008.

[5] McKinsey Global Institute, "Big Data: The Management Revolution - Harvard Business Review", 2011.

[6] "Big data: The next frontier for innovation, competition, and productivity | McKinsey Global Institute | Technology & Innovation | McKinsey & Company". [Online]. Available at: http://www.mckinsey.com/insights/mgi/research/technology_and_innovation/big_data_the_next_frontier_for_innovation. [Acessado: 07-mar-2013].

[7] B. A. Huberman, "Sociology of science: Big data deserve a bigger audience", *Nature*, vol. 482, nº 7385, p. 308-308, fev. 2012.

[8] C. Lynch, "Big data: How do your data grow?", *Nature*, vol. 455, nº 7209, p. 28-29, set. 2008.

[9] O. Trelles, P. Prins, M. Snir, e R. C. Jansen, "Big data, but are we ready?", *Nat. Rev. Genet.*, vol. 12, nº 3, p. 224-224, mar. 2011.

[10] K. Nakayama, M. Ito, T. Hara, e S. Nishio, "Wikipedia Mining for Huge Scale Japanese Association Thesaurus Construction", 2008, p. 1150-1155.

[11] M. B. Miles e A. M. Huberman, *Qualitative Data Analysis: An Expanded Sourcebook*. SAGE, 1994.

[12] Quoniam, L, Lucien, A, *Intelligence compétitive 2.0: organisation, innovation et territoire*. France: Librairie Lavoisier, 2010.

[13] Magalhaes, JL, Antunes, AMS, e Boechat, N, *Technological Trends in the Pharmaceutical Industry: the matter of neglected tropical diseases – An overview of the Research, Development & Innovation in Brazil*. Synergia Editora, 2012.

[14] WHO, "WHO | First WHO report on neglected tropical diseases", *WHO*, 2010. [Online]. Available at: http://www.who.int/neglected_diseases/2010report/en/. [Acessado: 21-jan-2013].

[15] S. Moon, J. Bermudez, e E. 't Hoen, "Innovation and Access to Medicines for Neglected Populations: Could a Treaty Address a Broken Pharmaceutical R&D System?", *PLoS Med*, vol. 9, nº 5, p. e1001218, maio 2012.

[16] J. P. Miller, *Millenium Intelligence: Understanding and Conducting Competitive Intelligence in the Digital Age*. Information Today, Inc., 2000.

[17] Quoniam, L, *Competitive Intelligence 2.0*. France: ISTE Ltd and John Wiley & Sons Inc, 2011.

[18] T. O'Reilly, "What is Web 2.0: Design Patterns and Business Models for the Next Generation of Software", Social Science Research Network, Rochester, NY, SSRN Scholarly Paper ID 1008839, ago. 2007.

[19] Bruyère, S, Soler, R, e Quoniam, L, "Popularité et implantation des solutions de Web Analytics comportementales en milieu francophone - eJournal of Digital Entreprise", *EJournal Digit. Entrep.*, nº 26, 2010.

[20] Ambrosi, A, Peugeot, V, e Pimenta, D, *Enjeux de mots - Regards multiculturels sur les sociétés de l'information*. France: C&F Editions, 2005.

[21] R. Balancieri, A. B. Bovo, V. M. Kern, R. C. dos S. Pacheco, e R. M. Barcia, "An analysis of scientific collaboration networks under the new technologies of information and communication: a study in Lattes Platform", *Ciênc. Informação*, vol. 34, nº 1, p. 64-77, jan. 2005.

[22] S. M. Imran, "IMPACT AND APPLICATION OF WEB 2.0 IN LIBRARIES: A CASE STUDY OF 12 NATIONAL LIBRARIES OF THE DEVELOPED NATIONS", *Braz. J. Inf. Sci.*, vol. 5, nº 2, jan. 2012.

[23] Antunes, AMS e Magalhaes, JL, Orgs., *Oportunidades em medicamentos genéricos: a indústria farmacêutica brasileira*. INTERCIENCIA, 2008.

[24] Antunes, AMS e Magalhaes, JL, Orgs., *Patenteamento e Prospecação Tecnológica no Setor Farmacêutico*. INTERCIENCIA, 2008.

[25] IMS Institute for Healthcare Informatics, "The Global Use of Medicines: outlook through 2016", 2012.

[26] G. Pirró, C. Mastroianni, e D. Talia, "A framework for distributed knowledge management: Design and implementation", *Future Gener. Comput. Syst.*, vol. 26, nº 1, p. 38-49, jan. 2010.

[27] Floridi, L., *Information: A Very Short Introduction*. Oxford University Press, 2010.

[28] O. Trelles, P. Prins, M. Snir, e R. C. Jansen, "Big data, but are we ready?", *Nat. Rev. Genet.*, vol. 12, nº 3, p. 224-224, mar. 2011.

[29] Quoniam, L, Lucien, A, *Intelligence compétitive 2.0: organisation, innovation et territoire*. France: Librairie Lavoisier, 2010.

[30] M. R. Trigo, L. B. Gouveia, L. Quoniam, e E. L. Riccio, *Using competitive intelligence as a strategic tool in a higher education context*. Nr Reading: Academic Conferences Ltd, 2007.

[31] Nova Spivack, "Articles | Nova Spivack - Minding the Planet", *Nova Spivack Minding The Planet*, 2013. [Online]. Available at: http://www.novaspivack.com/articles. [Acessado: 28-jan-2013].

[32] Huyghe, F.B., "Web 2.0: Influence, outils et réseaux", *Rev. Int. Intell. Econ.*, p. 11, 2009.

[33] L. S. Costa, C. A. G. Gadelha, e J. Maldonado, "A perspectiva territorial da inovação em saúde: a necessidade de um novo enfoque", *Rev. Saúde Pública*, nº ahead, p. 0-0, jan. 2012.

[34] J.-L. Vincent e M. Singer, "Critical care: advances and future perspectives", *The Lancet*, vol. 376, nº 9749, p. 1354-1361, out. 2010.

[35] D. Rouach e P. Santi, "Competitive Intelligence Adds Value: Five Intelligence Attitudes", *Eur. Manag. J.*, vol. 19, nº 5, p. 552-559, out. 2001.

[36] C. A. Gardner, T. Acharya, e D. Yach, "Technological And Social Innovation: A Unifying New Paradigm For Global Health", *Health Aff. (Millwood)*, vol. 26, nº 4, p. 1052-1061, jan. 2007.

[37] M. L. Wallace, V. Larivière, e Y. Gingras, "A Small World of Citations? The Influence of Collaboration Networks on Citation Practices", *PLoS ONE*, vol. 7, nº 3, p. e33339, mar. 2012.

[38] C. Dye, T. Mertens, G. Hirnschall, W. Mpanju-Shumbusho, R. D. Newman, M. C. Raviglione, L. Savioli, e H. Nakatani, "WHO and the future of disease control programmes", *The Lancet*, vol. 381, nº 9864, p. 413-418, fev. 2013.

[39] C. M. Morel, T. Acharya, D. Broun, A. Dangi, C. Elias, N. K. Ganguly, C. A. Gardner, R. K. Gupta, J. Haycock, A. D. Heher, P. J. Hotez, H. E. Kettler, G. T. Keusch, A. F. Krattiger, F. T. Kreutz, S. Lall, K. Lee, R. Mahoney, A. Martinez-Palomo, R. A. Mashelkar, S. A. Matlin, M. Mzimba, J. Oehler, R. G. Ridley, P. Senanayake, P. Singer, e M. Yun, "Health Innovation Networks to Help Developing Countries Address Neglected Diseases", *Science*, vol. 309, nº 5733, p. 401-404, jul. 2005.