**Procedures in Developing Quantitative Evidence of Discrimination in Treatment of Minority Groups**

**Introduction**

This report shows results from the ***use of algorithms in Excel*** that provide descriptions of a new topic (health disparities). A significant advantage is that the analyst does not need background knowledge of the subject. Instead, the world’s author-specialists serve as mentor-guides via their ideas. As such, students can learn new topics rapidly and begin to develop new descriptions and knowledge-generating strategies.

The algorithms are typical database edit functions and include sorting, copying, replacing, and arithmetic operations (e.g., counting and subtotaling). The availability of these functions aids in transforming a tedious manual process into a rapidly executed and quality-controlled one. While the algorithms are important tools, the ***idea*** is the element that makes it possible to formalize the intellectual processes visualized by Bloom (1956).

That learning taxonomy involved the following functions: ***retrieval, analysis, synthesis, comparison, evaluation, judgment***, and **application**. Clearly, the identification and retrieval of ideas, using the SEARCH option, satisfied formalization of the ***retrieval*** function. The ability to SORT, REPLACE, and FILTER satisfied the ***analysis*** function. Tables 2 -5 show examples of the ***synthesis*** function. The ***comparison*** function was illustrated in Tables 6 and 7. The **evaluation** function can be formalized using different criteria. The ***judgment*** function can be elaborated using the data developed. Finally, the ***application*** function can be applied by launching additional studies.

In a sense, critical thinking can be transformed from quoting past authors to one of considering the world’s view of the ideas composing a topic. Translating those observations/opinions into quantitative evidence is an example of data-driven critical thinking.

This report described the steps involved in comparing disease and treatment in a composite group labeled as ***Disparities*** with a specific subgroup labeled as ***LGBT***. The comparison is an example of the many possible when the total population is divided into subgroups. The LGBT group (Lesbians, Gays, Bisexuals, and Transgenders) is defined by sexual orientation rather than demographic or socioeconomic characteristics.

**Methods**

A text analysis approach (Weiner 1979) was introduced to operationalize and formalize Bloom’s (Bloom 1956) taxonomy of learning. That analytic approach focused on the ideas expressed by authors in acquiring and using information.(Weiner 1979, 2011) An idea was defined as the combination (pairs, trios, etc.) of informative terms contained within a sentence.(Chen 1988, Hoffman, 1980, Weiner 1979) This operational definition was based on the structure of the simple sentence consisting of a subject, verb, and object. The subject and object constituted a thought or an idea expressed by the author in conveying information.

Historically, linguists employed frequency of use of a key term as a measure in assessing importance in communication. Those frequently used informative terms (i.e., nouns, adjectives, or gerunds) were considered of greater importance in determining meaning. The premise was that subject experts would tend to employ favored terms in describing their subject. (Malogolowkin 1989, Piniewski-Bond 2001, Weiner 1984)

As with key terms and their interpretation, frequency of occurrence of ideas was considered to be an indicator of importance. In addition to presenting simple pairs of terms, authors may tend to use a specific pair as a bridge to more complex ideas. This is done by including additional informative terms within the same sentence. In considering health disparities, the additional terms might be descriptors of sexual minorities. As such, terms such as bisexual, gay, lesbian, and transgender could be included with terms such as health disparities and specific treatments. These complex combinations would express thoughts that were both specific and relevant.

Exhibit 1 shows examples of sentences and corresponding ideas. The document is identified by the assigned identification number. Added to that number for organization of references is the year of publication. The final identifying characteristic is the sentence containing the informative terms and associated ideas. Software-identified informative terms are highlighted in red. Missed terms are in blue. The idea set consists of the terms representing the idea, the time period entered into PubMed, the assigned identification number and the number of the sentence containing the idea.

**Exhibit 1. Sentences and Idea Sets Illustrating Determination of Capture Accuracy.**

***For women, having difficulty taking medications openly at home was associated with a substantial decrease in the probability of being on HAART*** (highly active antiretroviral therapy) ***in the adjusted model (0.59, 95% CI 0.47-0.70 vs. 0.78, 95% CI 0.74-0.83), whereas no significant differences were observed for heterosexual or gay/bisexual men.*** ***(16536681 – 2006)*** (Sayles 2006). The ideas extracted by the text analysis software included:

***Primary Related Time Period Doc ID Sentence***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| bisexual | Gay | 2005-2009 | 16536681 | 7 |
| bisexual | heterosexual | 2005-2009 | 16536681 | 7 |
| bisexual | Sexual | 2005-2009 | 16536681 | 7 |
| bisexual | Women | 2005-2009 | 16536681 | 7 |

***We also investigated the possible role of HIV infection among gay men and higher rates of psychological distress among lesbians, gay men, and bisexually and homosexually experienced heterosexual individuals in generating these health disparities. (17463371 – 2007)*** (Cochrane 2007). Ideas extracted included:

***Primary Related Time Period Doc ID Sentence***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| bisexual | Disparities | 2005-2009 | 17463371 | 2 |
| bisexual | Distress | 2005-2009 | 17463371 | 2 |
| bisexual | Gay | 2005-2009 | 17463371 | 2 |
| bisexual | Health | 2005-2009 | 17463371 | 2 |
| bisexual | heterosexual | 2005-2009 | 17463371 | 2 |
| bisexual | Hiv | 2005-2009 | 17463371 | 2 |
| bisexual | Infection | 2005-2009 | 17463371 | 2 |
| bisexual | Lesbian | 2005-2009 | 17463371 | 2 |
| bisexual | men | 2005-2009 | 17463371 | 2 |
| bisexual | psychological | 2005-2009 | 17463371 | 2 |
| bisexual | Sexual | 2005-2009 | 17463371 | 2 |

The advantages associated with displaying ideas as pairs of informative terms include:

1. The identification of specific ideas in building idea structures.
2. The ability to combine the pairs into more complex arrangements.

These advantages suggest that the hypothesis of interest could be – ***Can idea frequency and/or type be measures of medical discrimination in dealing with patients from sexual orientation minorities?***

**Procedures in Text Analysis**

The scholarly literature dealing with health disparities were retrieved from PubMed for the period 1990 through July 2015. There were 11,553 documents and contained 2,279,032 ideas.

The analytic software performs the following functions:

1. Separates the text into individual sentences using punctuation to recognize endings.
2. Identifies informative terms (nouns, adjectives, or gerunds) using characteristic endings and contextual relationships. The latter captures terms that authors have linked with recognized informative terms. Those terms may have endings different from those usually used in describing the grammatical words of interest. Examples of these contextually captured terms are: health, disparities, gay, lesbian, transgender. The term – bisexual – would be captured using the noun ending.
3. Combine informative terms in pairs within each sentence.
4. Generate idea records consisting of the pair of terms and bibliographic data indicating the involved document, date of publication and the location of the sentence within the document.
5. Store these idea records in excel files for subsequent analytic use.

The idea analysis software’s performance across topics yielded a median of 85% (66% - 99%) capture of vocabulary used by the authors. In the disparity subject, the capture of informative terms was 99%. Capture of ideas exceeded 95% across topics and over 99% in analysis of disparity ideas.

Table 1 gives an excerpt of the initial Excel file containing the ideas involving the primary terms -- disparity or disparities. This file is reduced in two ways:

1. The records for the time period 2014-2015 were processed using the ***REPLACE*** function. Those records were changed in color from black to blue. Using the ***FILTER*** option, the blue records were extracted and stored in a second file dealing with all of the Disparity-Related 2014-2015 records.
2. Related terms involving descriptors of diseases plus other terms from the same document and sentence were identified and changed from black to red. These records were extracted and stored in a new file. The resulting idea file (see Table 2 for excerpt from this Excel file) contained those records entered in 2014-2015 with disease. The file also contains disparity related records involving other informative terms present in the same sentences as the disease terms.

While shown as paired terms (e.g., disparities & related terms), the terms within a specific document and sentence could be combined as a complex idea (e.g., ***disparity & disease term & socioeconomic and/ or sexual orientation terms***).

A similar file involving ***disparity(disparities) & treatment with related terms*** is shown in Table 3. These two summary files (Tables 2 and 3) show disparity-related ideas dealing with disease and treatment.

Tables 4 and 5 show LGBT related ideas involving disease or treatment with related terms.

Tables 6 and 7 are comparisons of Disparities and LGBT relationships describing disease (Table 6) and treatment (Table 7). The terms are sorted showing frequency of the largest to the smallest in the LGBT group. In both, there are differences in idea occurrence with relatively large numbers of ideas with zero frequency in the LGBT group for the designated time period. The hypotheses that could be generated include:

1. Ideas can act as measures of different subgroups in the population.
2. Differences in use of ideas may be definable characteristics of individual subgroups.
3. Idea frequency is a viable attribute useful in comparing different subgroups.
4. Idea frequency offers a way to translate observations made by specialists into quantitative evidence.

**Conclusion**

The process applied to health disparities required managing of approximately 2.2 million ideas. Preliminary organizations suggested the possibility that discrimination of medical care in terms of access and treatment might be different in different subgroups of the population. Specific groups included – age, ethnicity, gender, race, socioeconomic groups and minorities identified by sexual orientation.

Traditional methods of analysis of literature have been an integral part of knowledge generation and utilization. When performed using established manual methods, the results could be considered as summary opinions rather than evidence. This leads to a paradox between evidence based on observation/opinion vs. that resulting from formalized study.

In a situation where ***description is the standard***, putting the disparate observations/opinions together could be a way to build the required evidence. However, in doing so, what is needed is an effective measure of the phenomenon. That requirement is satisfied by the idea – a combination of informative terms linked by the author-specialist and presented within the domain of the sentence. Ideas are independent building blocks reflecting specific aspects of the conceptual structure under consideration. The question considered in this report was – ***could ideas from the world’s authors be translated into quantitative evidence supporting a new description of the topic as well as hypotheses suitable for further testing?***

The Idea Analysis approach is a way to organize millions of ideas presented by world’s specialists. The result is a transparent and formalized path to critical thinking. By employing algorithms intended to organize and clarify the individual data points (observations and or opinions), students could duplicate the creative paths developed by specialists. Accelerating management of large volumes of information is a necessity in a world of search engines delivering millions of documents and websites. In a similar fashion, computer-supported algorithms make the processing feasible.

The idea analysis approach also has the advantage of being quantitative providing evidence that is more objective. If so, the data suggest that medical treatment discrimination is present, as has been claimed by numerous authors through time.

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**Table 1. Excerpt of Ideas Involving Disparity(Disparities) and Related Terms; 1990-2015.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Primary** | **Related** | **Year** | **Ident** | **Sentence** |
| disparities | african | 1990-1999 | 1291623 | 1 |
| disparities | american | 1990-1999 | 1291623 | 1 |
| disparities | ethnic | 1990-1999 | 1291623 | 1 |
| disparities | health | 1990-1999 | 1291623 | 1 |
| disparities | minorities | 1990-1999 | 1291623 | 1 |
| **:** | **:** | **:** | **:** | **:** |
| **:** | **:** | **:** | **:** | **:** |
| disparities | behavior | 2014-2015 | 22357550 | 9 |
| disparities | health | 2014-2015 | 22357550 | 9 |
| disparities | policies | 2014-2015 | 22357550 | 9 |
| disparities | sociocultural | 2014-2015 | 22357550 | 9 |
| disparities | abortion | 2014-2015 | 23000795 | 10 |
| disparities | population | 2014-2015 | 23000795 | 10 |
| disparities | education | 2014-2015 | 23687256 | 3 |
| **:** | **:** | **:** | **:** | **:** |
| **:** | **:** | **:** | **:** | **:** |
|  | **Etc.** |  | **Etc.** |  |

**Table 2. Excerpt of Disparities Related Ideas with Disease Terms: 2014-2015.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Disparities** | **Related** | **Year** | **Ident** | **Sentence** |
| disparities | **anxiety** | **2014-2015** | 24898691 | 10 |
| disparities | **anxiety** | **2014-2015** | 26634221 | 1 |
| disparity | **anxiety** | **2014-2015** | 24570204 | 6 |
| disparity | **anxiety** | **2014-2015** | 26689629 | 3 |
| disparities | **arthritis** | **2014-2015** | 26414775 | 1 |
| disparities | **arthritis** | **2014-2015** | 26605752 | 1 |
| disparity | **arthritis** | **2014-2015** | 24922134 | 7 |
| disparities | **asthma** | **2014-2015** | 25050834 | 10 |
| disparities | **asthma** | **2014-2015** | 25301036 | 10 |
| disparities | **asthma** | **2014-2015** | 25320897 | 3 |
| : | **:** | **:** | : | : |
| : | **:** | **:** | : | : |
| disparities | **atherosclerosis** | **2014-2015** | 26142402 | 1 |
| disparities | **autism** | **2014-2015** | 26437907 | 3 |
| disparities | **autism** | **2014-2015** | 26505871 | 1 |
| disparity | **bipolar** | **2014-2015** | 24492903 | 1 |
| disparities | **bladder** | **2014-2015** | 25885914 | 5 |
| disparities | **bladder** | **2014-2015** | 26346676 | 3 |
| disparities | **bladder** | **2014-2015** | 26346676 | 15 |
| disparities | **breast** | **2014-2015** | 23943016 | 1 |
| disparities | **breast** | **2014-2015** | 24625787 | 9 |
| disparities | **breast** | **2014-2015** | 24810518 | 1 |
| : | **:** | **:** | : | : |
| : | **:** | **:** | : | : |
|  | **Etc.** |  | **Etc.** |  |

**Table 3.** **Excerpt of Disparities Related Ideas with Treatment Terms: 2014-2015.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Disparities** | **Related** | **Year** | **Ident** | **Semtence** |
| disparities | **abortion** | **2014-2015** | 23000795 | 10 |
| disparities | **abortion** | **2014-2015** | 25779755 | 9 |
| disparities | **amputation** | **2014-2015** | 26490803 | 1 |
| disparity | **amputation** | **2014-2015** | 26549811 | 7 |
| disparity | **angiography** | **2014-2015** | 24886321 | 10 |
| disparity | **angiography** | **2014-2015** | 25331586 | 10 |
| disparity | **angiography** | **2014-2015** | 25331586 | 13 |
| disparities | **antidepressant** | **2014-2015** | 25620439 | 2 |
| disparity | **antidepressant** | **2014-2015** | 24828481 | 4 |
| **:** | **:** | **:** | **:** | **:** |
| **:** | **:** | **:** | **:** | **:** |
| disparities | **antiretroviral** | **2014-2015** | 25792300 | 1 |
| disparities | **antiretroviral** | **2014-2015** | 25853590 | 2 |
| disparities | **antiretroviral** | **2014-2015** | 26551839 | 1 |
| disparities | **arthroplasty** | **2014-2015** | 25889569 | 1 |
| disparities | **arthroplasty** | **2014-2015** | 26413459 | 1 |
| disparities | **care** | **2014-2015** | 23811693 | 3 |
| disparities | **care** | **2014-2015** | 23811693 | 4 |
| disparities | **care** | **2014-2015** | 23811693 | 6 |
| disparities | **care** | **2014-2015** | 24633914 | 3 |
| **:** | **:** | **:** | **:** | **:** |
| **:** | **:** | **:** | **:** | **:** |
|  | **Etc.** |  | **Etc.** |  |

**Table 4. Excerpt of LGBT Related Ideas with Disease Terms: 2014-2015.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Primary** | **Related** | **Year** | **Ident** | **Sentence** |
| lgbt | **anxiety** | **2014-2015** | 26009978 | 5 |
| lgbt | **anxiety** | **2014-2015** | 26010289 | 5 |
| lgbt | **asthma** | **2014-2015** | 24612383 | 7 |
| lgbt | **cancer** | **2014-2015** | 25542320 | 1 |
| lgbt | **cancer** | **2014-2015** | 25542320 | 4 |
| lgbt | **cancer** | **2014-2015** | 25542320 | 5 |
| lgbt | **cancer** | **2014-2015** | 25542320 | 6 |
| lgbt | **cancer** | **2014-2015** | 25542320 | 11 |
| lgbt | **cancer** | **2014-2015** | 25542320 | 12 |
| lgbt | **cancer** | **2014-2015** | 25630987 | 1 |
| **:** | **:** | **:** | **:** | **:** |
| **:** | **:** | **:** | **:** | **:** |
| lgbt | **health** | **2014-2015** | 26566532 | 4 |
| lgbt | **health** | **2014-2015** | 26718773 | 3 |
| lgbt | **hiv** | **2014-2015** | 25678895 | 1 |
| lgbt | **hiv** | **2014-2015** | 25231783 | 3 |
| lgbt | **hiv** | **2014-2015** | 26303197 | 3 |
| lgbt | **hiv** | **2014-2015** | 26334445 | 2 |
| lgbt | **hiv** | **2014-2015** | 26411930 | 1 |
| lgbt | **hiv** | **2014-2015** | 26698656 | 11 |
| lgbt | **infection** | **2014-2015** | 25678895 | 1 |
| lgbt | **loneliness** | **2014-2015** | 26009978 | 5 |
| lgbt | **loneliness** | **2014-2015** | 26009978 | 6 |
| lgbt | **loneliness** | **2014-2015** | 26010289 | 5 |
| lgbt | **loneliness** | **2014-2015** | 26010289 | 6 |
| lgbt | **mental** | **2014-2015** | 25545433 | 3 |
| lgbt | **mental** | **2014-2015** | 25961598 | 2 |
| lgbt | **mental** | **2014-2015** | 25124211 | 1 |
| lgbt | **stress** | **2014-2015** | 25630987 | 9 |
| lgbt | **stress** | **2014-2015** | 26009978 | 5 |
| lgbt | **stress** | **2014-2015** | 26009978 | 6 |
| lgbt | **stress** | **2014-2015** | 26010289 | 5 |
| lgbt | **stress** | **2014-2015** | 26010289 | 6 |
|  | **Etc.** |  | **Etc.** |  |
|  |  |  |  |  |

**Table 5. Table 4. Excerpt of LGBT Related Ideas with Treatment Terms: 2014-2015.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Primary** | **Related** | **Year** | **Ident** | **Sentence** |
| lgbt | **care** | **2014-2015** | 25535762 | 1 |
| lgbt | **care** | **2014-2015** | 25535762 | 2 |
| lgbt | **care** | **2014-2015** | 25535762 | 3 |
| lgbt | **care** | **2014-2015** | 25535762 | 6 |
| lgbt | **care** | **2014-2015** | 25542320 | 11 |
| lgbt | **care** | **2014-2015** | 25542320 | 12 |
| lgbt | **care** | **2014-2015** | 25542320 | 13 |
| lgbt | **care** | **2014-2015** | 25674911 | 2 |
| lgbt | **care** | **2014-2015** | 25961598 | 1 |
| lgbt | **care** | **2014-2015** | 25961598 | 2 |
| lgbt | **care** | **2014-2015** | 26151148 | 6 |
| **:** | **:** | **:** | **:** | **:** |
| **:** | **:** | **:** | **:** | **:** |
| lgbt | **nursing** | **2014-2015** | 25535762 | 6 |
| lgbt | **nursing** | **2014-2015** | 25542320 | 12 |
| lgbt | **nursing** | **2014-2015** | 25290963 | 2 |
| lgbt | **prevent** | **2014-2015** | 24320148 | 9 |
| lgbt | **prevent** | **2014-2015** | 25231783 | 1 |
| lgbt | **prevent** | **2014-2015** | 24612383 | 7 |
| lgbt | **psychological** | **2014-2015** | 25545433 | 4 |
| lgbt | **psychological** | **2014-2015** | 25630987 | 9 |
| lgbt | **psychological** | **2014-2015** | 25231783 | 3 |
|  | **Etc.** |  | **Etc.** |  |

**Table 6. Comparison of Idea Frequencies – Disease Related Terms & Disparities or LGBT: 2014-2015.**

|  |  |  |
| --- | --- | --- |
| **Terms** | **Disparity** | **LGBT** |
| **Total Ideas** | **3425** | **122** |
| health | 1544 | 70 |
| cancer | 372 | 14 |
| depression | 26 | 7 |
| distress | 11 | 6 |
| hiv | 90 | 6 |
| stress | 23 | 5 |
| loneliness | 0 | 4 |
| mental | 92 | 3 |
| anxiety | 4 | 2 |
| asthma | 22 | 1 |
| cardiovascular | 31 | 1 |
| chronic | 46 | 1 |
| diabetes | 70 | 1 |
| infection | 32 | 1 |
| arthritis | 3 | **0** |
| atherosclerosis | 1 | **0** |
| autism | 2 | **0** |
| bipolar | 1 | **0** |
| bladder | 3 | **0** |
| breast | 104 | **0** |
| cardiac | 10 | **0** |
| caries | 9 | **0** |
| cataract | 2 | **0** |
| cirrhosis | 2 | **0** |
| coronary | 8 | **0** |
| death | 40 | **0** |
| dental | 27 | **0** |
| depressive | 8 | **0** |
| diabetic | 4 | **0** |
| disabilities | 33 | **0** |
| disability | 18 | **0** |
| epidemic | 7 | **0** |
| epilepsy | 2 | **0** |
| erythematosus | 2 | **0** |
| fatal | 4 | **0** |
| genetic | 40 | **0** |
| genome | 3 | **0** |
| genotype | 3 | **0** |
| glucose | 2 | **0** |
| glycaemic | 2 | **0** |
| glycemic | 2 | **0** |
| gynecologic | 3 | **0** |
| hearing | 4 | **0** |
| heart | 24 | **0** |
| hepatitis | 3 | **0** |
| hpv | 26 | **0** |
| hypertension | 26 | **0** |
| hypertensive | 1 | **0** |
| infarction | 4 | **0** |
| injury | 14 | **0** |
| ischemic | 4 | **0** |
| kidney | 20 | **0** |
| malignant | 1 | **0** |
| metastatic | 3 | **0** |
| morbid | 53 | **0** |
| mortal | 184 | **0** |
| myocardial | 4 | **0** |
| neoplasm | 1 | **0** |
| neuropsychological | 2 | **0** |
| obesity | 84 | **0** |
| oropharyngeal | 3 | **0** |
| ovarian | 10 | **0** |
| overweight | 11 | **0** |
| papillomavirus | 9 | **0** |
| pregnant | 8 | **0** |
| prostate | 19 | **0** |
| psychiatric | 10 | **0** |
| psychological | 14 | **0** |
| psychotic | 2 | **0** |
| pulmonary | 5 | **0** |
| rectal | 22 | **0** |
| rheumatoid | 2 | **0** |
| sclerosis | 1 | **0** |
| sleepiness | 1 | **0** |
| stroke | 41 | **0** |
| tuberculosis | 3 | **0** |
| tumor | 19 | **0** |
| uterine | 4 | **0** |
| vaginal | 2 | **0** |
| vision | 27 | **0** |
| weight | 46 | **0** |

**Table 7. Comparison of Idea Frequencies – Treatment Related Terms & Disparities or LGBT: 2014-2015.**

|  |  |  |
| --- | --- | --- |
| **Terms** | **Disparity** | **LGBT** |
| **Total Ideas** | **1328** | **71** |
| care | 722 | 32 |
| education | 158 | 22 |
| nurse | 15 | 5 |
| nursing | 29 | 4 |
| prevent | 127 | 3 |
| psychological | 14 | 3 |
| medicaid | 33 | 1 |
| medicare | 25 | 1 |
| abortion | 2 | **0** |
| amputation | 2 | **0** |
| angiography | 3 | **0** |
| antidepressant | 3 | **0** |
| antipsychotic | 1 | **0** |
| antiretroviral | 3 | **0** |
| arthroplasty | 2 | **0** |
| chemotherapy | 4 | **0** |
| colectomy | 2 | **0** |
| colonoscopy | 5 | **0** |
| coping | 5 | **0** |
| dialysis | 6 | **0** |
| dietary | 9 | **0** |
| endarterectomy | 1 | **0** |
| hemodialysis | 1 | **0** |
| hospice | 2 | **0** |
| hysterectomy | 4 | **0** |
| immunization | 13 | **0** |
| nutrition | 20 | **0** |
| opioid | 5 | **0** |
| palliative | 2 | **0** |
| prophylaxis | 4 | **0** |
| psychiatric | 10 | **0** |
| psychotherapy | 3 | **0** |
| rehabilitation | 9 | **0** |
| resuscitation | 1 | **0** |
| sigmoidoscopy | 1 | **0** |
| telehealth | 4 | **0** |
| telemedicine | 2 | **0** |
| transplantation | 23 | **0** |
| vaccination | 35 | **0** |
| vaccine | 18 | **0** |