

# Public Health as a Social Phenomenon from a Biblical Perspective: Automated Identification

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## Abstract

This research focuses on the issue of public health, its protection and promotion of a healthy lifestyle. Public health is one of the most important priorities in society around the world. Notable attention is given to the perception of public health from a Biblical perspective. The corpus of the research contains ‘The Holy Scriptures according to the Masoretic texts: A New translation, with the aid of previous versions and with constant consultation of Jewish authorities.’ The attempt is made to analyse and interpret the notion of public health in the Bible and present it by vocabulary expressing the same meaning. The intention is paid to see a word sketch with the most typical combinations by processing words with collocations and other words in its surrounding. The linguistic processing of the text is done by lemmatisation. The results have been distributed into grammatical categories such as words that serve as an object of the noun, words that serve as a subject of the noun, words that modify the noun, the noun used with ‘and/or’, prepositional phrases, adjective predicates of the noun, pronominal possessors of the noun, and verbs used with the noun. An online text analysis tool Sketch Engine is used to make the linguistic analysis of key terms and process large number of texts in order to identify typical and most frequent usage. Eight lemmas have been singled to denote public health: *life*, *blessing*, *peace*, *health*, *clean*, *unclean*, *rest* and *joy*. Findings suggest that *life*, *peace*, *rest*, *joy*, *clean* and *unclean* and are the most frequent lemmas to denote health. The surprising fact is that lemma *health* is used only nine time in the researched text.

## Keywords

Public health, Sketch Engine, grammatical category, Holy Scripture, lemma, automated identification.

## 1. Introduction

Public health is the science that aims to protect the health of people and communities multidimensionally and holistically. This is accomplished by promoting healthy and environmental-friendly lifestyles; providing equal access to the medical services and care; researching and detecting various diseases; preventing and addressing the emerging infectious diseases, to name some of the aspects. The World Health Organization (WHO) in its preamble to the Constitution defines health as ‘a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’ [1]. Moreover, the WHO claims that ‘enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition [1]. When we think of a person’s health, we should take into account the various domains that effects the health status of an individual: the genotype (a genetic makeup); social circumstances (social status, education, income); environmental settings (pollution, toxic and bacterial agents); behavioural choices (eating habits, physical activity); the health care (access to the quality medical services) [2, p. 5]. James F. McKenzie, Robert R. Pinger, and Denise Seabert observe that usually four expressions such as ‘public health’, ‘community health’, ‘population

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health' and 'global health' are used interchangeably to define the health status of a given social group, yet, the phrase 'public health' seems to be the most inclusive and can be applied to various level of population's health locally and globally [2, 5-6].

The National Academy of Medicine (until 2015 the Institute of Medicine), an American nonprofit, non-governmental organization, published a report titled as 'The Future of the Public Health' in 1988 that shows how public health achievements have prevented innumerable deaths and improved the quality of life in the USA. These accomplishments were possible due to provision of various public health measures such as control of epidemic diseases, safe food and clean water, maternal and child health services, teaching about healthy habits and hygiene to name some activities [3]. At the same time, this report points to the need for a better collaboration between different state, federal, local institutions, and agencies to assure conditions in which people can be healthy or, in other words, the community can be healthy [3]. The past two years have shown the prevalence of new threats to human health on a global level. The spread of the COVID-19 disease has resulted in an unprecedented series of lockdown with the profound effects on everyday life: it has altered people's lives, their normal habits, in-person communication, travel abilities, even religious beliefs, and practices. Public health institutions along with the ministries of health issued a series of measures to prevent transmission of the COVID-19: masks, physical distancing, hygiene, and quarantine among the basic ones. At the same time, one might find recommendations such as how to look for elderly neighbours, for those in self-isolation, how to volunteer and fundraise for those who are financially impacted by the quarantine measures, how to combat misinformation and share words of kindness and encouragement, to flourish as part of the public health institutions [9].

## 2. Related works

Many scientists have recently put their interest in the discussion on public health [4, pp. 542-545; 5, pp. 7-11; 6, pp. 618-624]. James F. McKenzie, Robert R. Pinger, and Denise Seabert distinguish four key factors that affect the health of the community: physical factors (geographical location, environmental situation, community size, industrial development), social and cultural factors (religion, traditions, economy, politics, and social norms), community organization (how community is able to mobilize and co-work together) and individual behaviour (the responsibility of each person for the well-being of other members of a given community) [2, pp. 6-9]. Religious stance plays an important role in how people react to the state policies of public health. For instance, some religious groups do not accept the possibility of blood transfusion for a sick person, some prohibit immunization or even to be treated by physicians, some discuss the moral issues of abortion and euthanasia. The recent pandemic situation with COVID-19 both globally and locally showed that religious institutions do play an important role in promoting public health by encouraging and building public trust in the efficacy of COVID-19 vaccines and calling on the world leaders to provide countries with bad economic situation with the vaccines. Pope Francis notes that 'getting vaccinated is a simple yet profound way to care for one another, especially the most vulnerable' [10]. The Ecumenical Patriarch Bartholomew making his vaccination public encouraged the people of his Church to impede this global disease and issued a letter of encouragement [11].

The Ukrainian Council of Churches and Religious Organizations (an interdenominational non-governmental institution) released a statement regarding the process of vaccination in Ukraine. In this document the UCCRO emphasized the importance of protective measures such as masks, keeping physical distance, disinfection during liturgies or communal prayers. Church leaders also indicate that vaccination is not the matter of religions but that of medicine and does not interfere with religious freedom. However, the state cannot force people to get vaccinated, on the one hand, and should provide equal opportunities for everyone who wishes to be vaccinated, on the other hand [12].

George Rosen in his seminal work 'A History of Public Health' first published in 1958 (it was reissued as an expanded and revised edition in 2015 by Johns Hopkins University Press) traces the concern of human's health back to the time of ancient Mesopotamia and Egypt, however, it only briefly mentions the texts of the Hebrew Bible/Old Testament. Still, ancient Israelites as modern people today also faced different types of problems related to what we define as public health: how to control transmissible diseases, how to tackle the lack of good food and water supply, how to properly

provide medical care, how to keep good hygiene, how to deal with people who are mentally and/or physically disabled, how to live holistically. The Hebrew Bible/Old Testament contains instructions, in biblical parlance laws, how to an individual and the entire community should live healthy. The father of public health Charles-Edward Amory Winslow in his opening address at the second annual meeting of the American Association for the Advancement of Science entitled 'The Untilled Fields of Public Health' described the public health as 'the science and art of preventing disease, prolonging life, and promoting health and efficiency through organized community effort for the sanitation of the environment, the control of communicable infections, the education of the individual in personal hygiene, the organization of medical and nursing services for the early diagnosis and preventive treatment of disease' [13, pp. 2-3]. The biblical laws and precepts are religious in its nature, yet they aim at the physical and mental well-being of the chosen people. In other words, what one finds in the Hebrew Bible is a compendium of instructions for a community how to organize and preserve its own health. It should be noted that there is no dichotomy between the soul and body in the Hebrew Bible/Old Testament: a human being is perceived as one entity, a one living soul. As Larry Paul Logan correctly observes 'in regard to illness he [a human being] cannot be ill in body and healthy in his mind or soul [14, p. 3]. For that reason, the perception of a person is holistic. The Hebrew word 'shalom (in English can be translated as 'peace', 'prosperity') describes the harmony of relationships between humans and God, humans and humans, humans and environment. It also refers to the holistic view of the life of an individual, including his or her health. To live holistically (*i.e.* healthily) in biblical terms means to eat clean food and to avoid what is forbidden; to moderate the amounts of alcohol; to keep hygienic rules and to avoid contact with the corpse; to go into quarantine if someone diagnosed with the skin diseases or other possibly infectious diseases; to take a rest from work (*i.e.* to observe the Sabbath and other holy days. It takes discipline to be healthy, maintain one's mental health (*i.e.* to enjoy own life, to leave all anxieties to God), to remember that keeping the laws is a responsibility towards own community.

It is proven that this topic is not a new phenomenon but rather an aspect with which humanity has been concerning throughout history. However, there has been no attempt to study public health from the Biblical perspective based on linguistic analysis. The novelty of this article is that for the first time public health is studied with the implementation of a method of automated searching of certain linguistic units. A number of scholars have contributed to linguistic text analyses [8, pp. 55 – 62; 7] but 'public health' hasn't been a subject of automated identification.

### **3. Methods and materials**

The purpose of the work is to define the issue of public health as a science which is aimed at protecting and improving health of communities, particularly from the Biblical perspective. We made an attempt to create an overview of public health perception in the Hebrew Bible/Old Testament. General scientific methods, particularly descriptive and modelling have been used to carry out the research. Descriptive method is applied to study the structure of language through the analysis of the forms (lexicon). Modelling approach is used to present the meaning of 'public health' and vocabulary to express these meanings; this involves constructing statements that can define new meanings based on given ones. The deductive method was of great used to predict the outcome and analyse data. It helps to notice patterns and to work out a rule, for example to single out linguistic units for expressing the notion of public health in the Hebrew Bible/Old Testament. Methods of observation, comparison, classification, generalization and interpretation were applied to provide the perception of public health from the biblical viewpoint.

The method of observation helps us to collect data for the research. Comparative method reconstructs collected data on public health with the present view of the notion (based on comparison of related words). Classification is used to group units according to their degree of relatedness. Searching for common properties of data to formulate general concepts is based on generalisation. At the final stage we introduce interpretation which is a process to explain and convey a meaning of terms accurately and efficiently. To make the linguistic analysis of key terms we used Sketch Engine, an online text analysis tool [15]. This tool can work with large number of texts in order to identify typical and most frequent usage.

The corpus of the research contains ‘The Holy Scriptures according to the Masoretic texts: A New translation with the aid of previous versions and with constant consultation of Jewish authorities’ [16]. The algorithm to extract data, analyse them and visualize the results in the form of diagrams has the following sequence:

1. Log in to [www.sketchengine.ua](http://www.sketchengine.ua)
2. Upload needed corpus (‘The Holy Scriptures according to the Masoretic texts: A New translation with the aid of previous versions and with constant consultation of Jewish authorities’).
3. Search by ‘lemma’ which is a form of a word under which it is registered in a dictionary.
4. Type a word and see a word sketch with the most typical combinations.
5. Processes words with collocations and other words in its surrounding.
6. The results are organized into categories, called grammatical relation, such as words that serve as an object of the noun, words that serve as a subject of the noun, words that modify the noun, the noun used with ‘and/or’, prepositional phrases, adjective predicates of the noun, pronominal possessors of the noun, verbs used with the noun etc.
7. Apply visualization method to present information in a convenient format.
8. Selection and transformation of graphic objects is done by implementing an empirical method.
9. Adjustment of the graphs such as the change of local properties is done at the final stage.
10. The diagrams introduced in the article are presented as a result.

#### 4. Discussions and results

The aim of the work is to show that issues on public health are not new in society. The Bible provides us with great examples of a public health strategy. Two hypotheses are proposed to be tested:

**Hypothesis 1.** Methodical approach of modelling has been applied to single out the most appropriate nouns which denote the meaning of ‘public health’ in the Hebrew Bible/Old Testament. This hypothesis will be tested by a comparative analysis of collected data, their statistics, and classification.

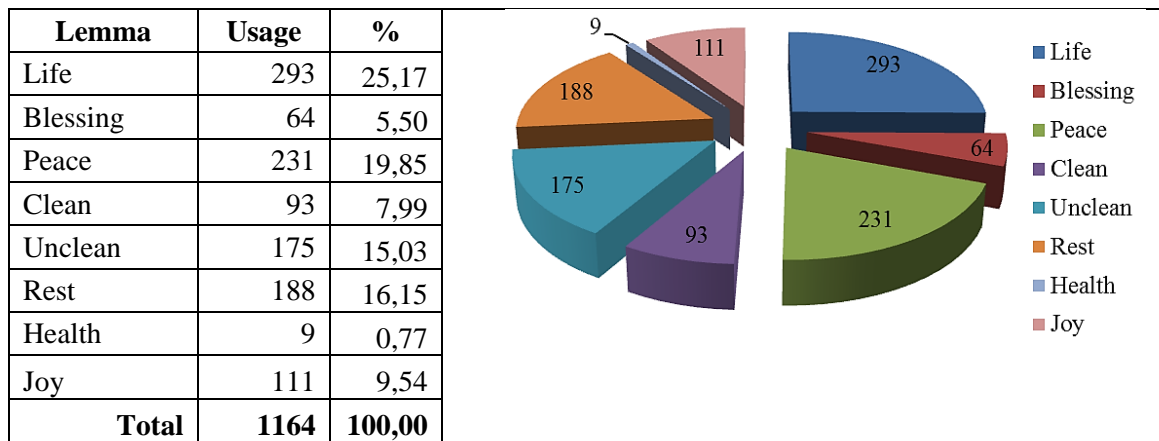
**Hypothesis 2.** Then we intend to see a word sketch with the most typical combinations by processing words with collocations and other words in its surrounding. The results are to be organized into grammatical categories such as words that serve as an object of the noun, words that serve as a subject of the noun, words that modify the noun, the noun used with ‘and/or’, prepositional phrases, adjective predicates of the noun, pronominal possessors of the noun, verbs used with the noun etc.

It is essential to emphasise that based on prior research public health includes:

1. Taking care of the quality of life (life):  
*Be not wise in thine own eyes; fear the LORD, and depart from evil; It shall be health to thy navel, and marrow to thy bones [16, p. 1052]; A merry heart is a good medicine; but a broken spirit drieth the bones [16, p. 1076]; I know that there is nothing better for them, than to rejoice, and to get pleasure so long as they live. But also that every man should eat and drink, and enjoy pleasure for all his labour, is the gift of God [16, p. 1177].*
2. Living holistically, in peace with God, others and self (blessing, peace):  
*But the humble shall inherit the land, and delight themselves in the abundance of peace [16, p. 949]; Acquaint now thyself with Him, and be at peace; thereby shall thine increase be good [16, p. 1125].*
3. Eating healthily and being moderate with alcohol (health):  
*Be not among winebibbers; among gluttonous eaters of flesh; For the drunkard and the glutton shall come to poverty; and drowsiness shall clothe a man with rags [16, p. 1085]; Wherefore do ye spend money for that which is not bread? and your gain for that which satisfieth not? Hearken diligently unto Me, and eat ye that which is good, and let your soul delight itself in fatness [16, p. 644].*
4. Taking care of the body and its hygiene (clean and unclean):  
*And if the flow of seed go out from a man, then he shall bathe all his flesh in water, and be unclean until the even. And every garment, and every skin, whereon is the flow of seed, shall be washed with water, and be unclean until the even [16, p. 162].*

5. Remember to rest and give others this possibility (rest):  
*But the seventh day is a sabbath unto the LORD thy God, in it thou shalt not do any manner of work, thou, nor thy son, nor thy daughter, nor thy man-servant, nor thy maid-servant, nor thy cattle, nor thy stranger that is within thy gates* [16, p. 104]
6. Bring others joy and encouragement (joy):  
*Then he said unto them: 'Go your way, eat the fat, and drink the sweet, and send portions unto him for whom nothing is prepared; for this day is holy unto our Lord; neither be ye grieved; for the joy of the LORD is your strength* [16, p. 1249].

Let us consider public health based on the keywords singled out from the concept which are *life, blessing, peace, health, clean, unclean, rest* and *joy*. The total number of words is 1164 where 'life' – 293, 'peace' – 231, 'rest' – 188 and 'unclean' – 175 are used the most. 'Joy' – 111, 'clean' – 93 and 'blessing' – 64 take important positions in the group (Fig. 1).



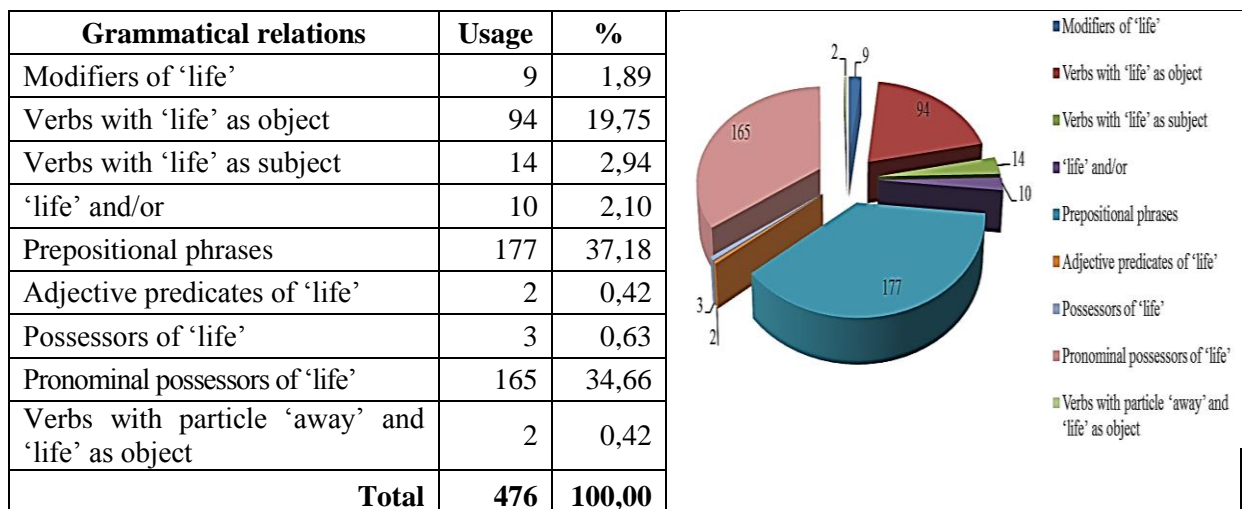
**Figure 1:** Group of words denoting the concept of public health

Here are some examples of the usage of words denoting *public health*:

Pleasant words are as a honeycomb, sweet to soul, and **health** to the bones [16, p. 1073].

And I will make of thee a great nation, and I will bless thee, and make thy name great, and be thou a **blessing** [16, p. 14]. He said: 'My presence shall go with thee and I will give the **rest**' [16, p. 125].

Let us research the grammatical relations of each concept. These relations can be as following: words that serve as an object of the noun, words that serve as a subject of the noun, words that modify the noun, the noun used with 'and/or', prepositional phrases, adjective predicates of the noun, pronominal possessors of the noun, verbs used with the noun.



**Figure 2:** Grammatical relations of 'life'

Figure 2 demonstrates grammatical relations of 'life'. Nine grammatical relations are used in this category (total number 177: modifiers of 'life' – 9, verbs with 'life' as object – 94, verbs with 'life' as subject – 14, 'life' and/or – 10, prepositional phrases -177, adjective predicates of 'life' -2, possessors of 'life' -3, pronominal possessors of 'life' – 165 and verbs with particle 'away' and 'life' as object – 2. Verbs with 'life' as object, prepositional phrases and pronominal possessors of 'life' are considerably larger in number than other grammatical relations. Let us consider some examples:

For the **life** of the flesh is in the blood; and I have given it to you upon the altar to make atonement for your soul [16, p. 165]; **Death and life** are in the power of the tongue; And they that indulge it shall eat the fruit thereof. [Proverbs 18:21, p. 1076]; Remember that **my life is** a breath [16, p. 1107].

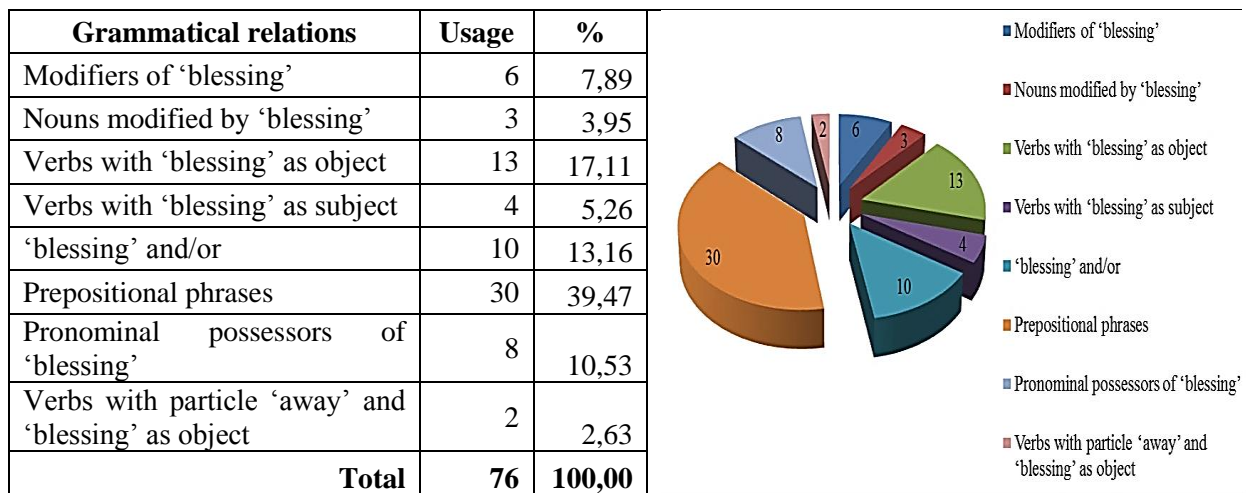


Figure 3: Grammatical relations of 'blessing'

Figure 3 presents eight relations of word 'blessing' in the text of corpus (total number 76: modifiers of 'blessing' – 6, nouns modified by 'blessing' – 3, verbs with 'blessing' as object – 13, verbs with 'blessing' as subject – 4, 'blessing' and/or – 10, prepositional phrases – 30, pronominal possessors of 'blessing' – 8, verbs with particle 'away' and 'blessing' as object – 2. This group is remarkably shorter than the previous one. The majority in the group is given to prepositional phrases.

Let us have a look at some grammatical relations of 'blessing':

...then I will command **My blessing** upon you in the sixth year, and it shall bring forth produce for the three years [16, p. 178]; And she said unto him: '**Give me a blessing**; for that thou hast set me in the Southland, give me therefore springs of water.' [16, p. 345]; ... and I will cause the shower to come down in its season; there shall be showers **of blessing** [16, p. 813].

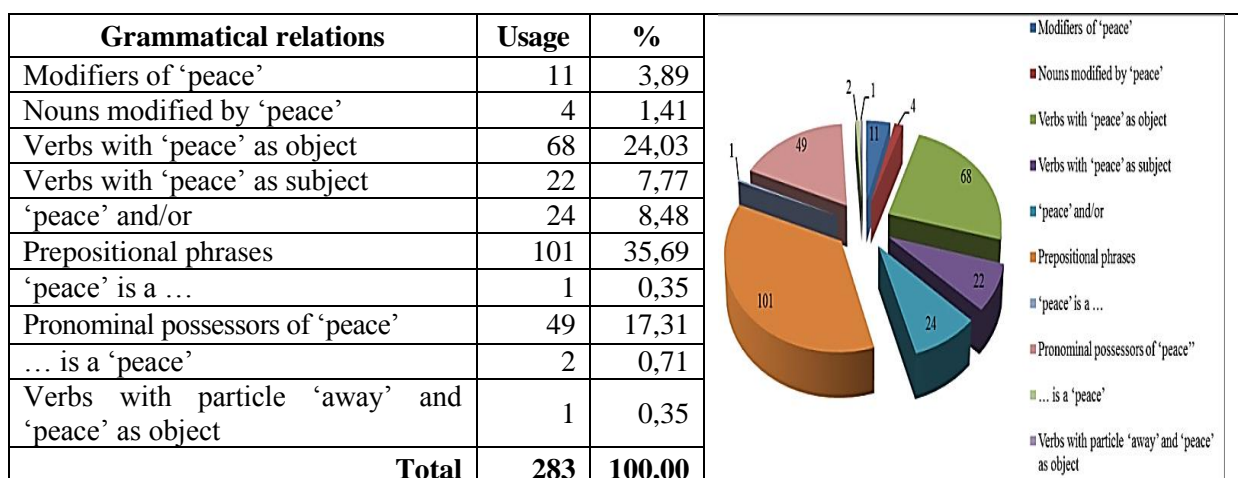


Figure 4: Grammatical relations of 'peace'

Figure 4 provides information about the grammatical relation of ‘peace’. The total number of these relations is 283 which are singled out into ten categories. They include: modifiers of ‘peace’ – 11, nouns modified by ‘peace’ – 4, verbs with ‘peace’ as object – 68, verbs with ‘peace’ as subject – 22, ‘peace’ and/or – 24, prepositional phrases – 101, ‘peace’ is a ... – 1, pronominal possessors of ‘peace’ – 49, ... is a ‘peace’ – 2, verbs with particle ‘away’ and ‘peace’ as object – 1. ‘Peace’ most often is used with prepositional phrases and verbs with ‘peace’ as object.

We would like to show some examples of the relations of ‘peace’:

Moreover, I will make a covenant **of peace** with them – it shall be an everlasting covenant with them; and I will establish them, and multiply them, and will set My sanctuary in the midst of them for ever [16, p. 818].

Dominion and fear are with Him; He **maketh peace** in His high places [16, p. 1128].

Now therefore give not your daughters unto their sons, neither take their daughters unto your sons, nor **seek their peace** or their prosperity for ever; that ye may be strong, and eat the good of the land, and leave it for an inheritance to your children for ever [16, p. 1235].

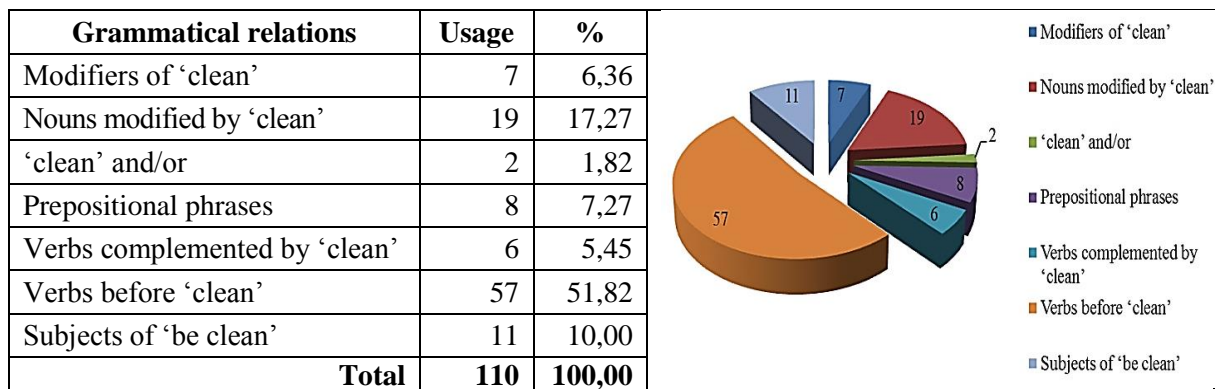


Figure 5: Grammatical relations of ‘clean’

Figure 5 shows the next unit – grammatical relations of ‘clean’. It has 110 following combinations which are structured into seven groups: modifiers of ‘clean’ – 7, nouns modified by ‘clean’ – 19, ‘clean’ and/or – 2, prepositional phrases – 8, verbs complemented by ‘clean’ – 6, verbs before ‘clean’ – 57, subjects of ‘be clean’ – 11.

Here are the examples of the usage of grammatical relations of ‘clean’:

And I will sprinkle **clean water** upon you, and ye shall be clean; from all your uncleannesses, and from all your idols, will I cleanse you [16, p. 816].

If I wash myself with snow water, And make my hands never **so clean** [16, p. 1110].

All things come alike to all; there is one event to the righteous and to the wicked; to the good and to **the clean and** to the unclean [16, p. 1183].

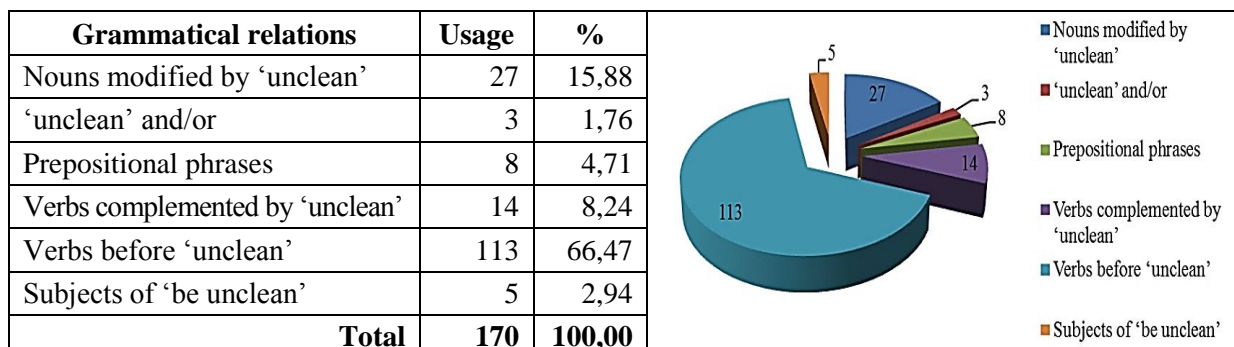


Figure 6: Grammatical relations of ‘unclean’

Figure 6 introduces a grammatical relation of ‘unclean’ grouped into six relations: nouns modified by ‘unclean’ – 27, ‘unclean’ and/or – 3, prepositional phrases – 8, verbs complemented by ‘unclean’ – 14, verbs before ‘unclean’ – 113, subjects of ‘be unclean’ – 5. Total number of these relations is 170.

Some examples of grammatical relations of ‘unclean’ are:

But Ephraim shall return to Egypt, And they shall eat **unclean food** in Assyria [16, p. 846]; And that ye may put difference between the holy and the common, and between **the unclean and the clean** [16, p. 152]; Then said Haggai: ‘If one that is unclean by a dead body touch any of these, shall it **be unclean**?’ [16, p. 897].

Another grammatical relation is ‘rest’ which consists of 108 relations singled out into eight groups: modifiers of ‘rest’ – 16, nouns modified by ‘rest’ – 7, verbs with ‘rest’ as object – 32, verbs with ‘rest’ as subject – 1, ‘rest’ and/or – 12, prepositional phrases – 30, pronominal possessors of ‘rest’ – 8, verbs with particle ‘unto’ and ‘rest’ as object – 2.

Let us have a look at some grammatical relations of ‘rest’:

And ye shall **find rest** for your souls [16, p. 674].

And Naomi her mother-in-law said unto her: ‘My daughter, shall I not **seek rest** for thee, that it may be well with thee? [16, p. 1162].

Return, O my soul, unto **Thy rest**; For the LORD hath dealt bountifully with thee [16, p. 1022].

The results are represented in Figure 7.

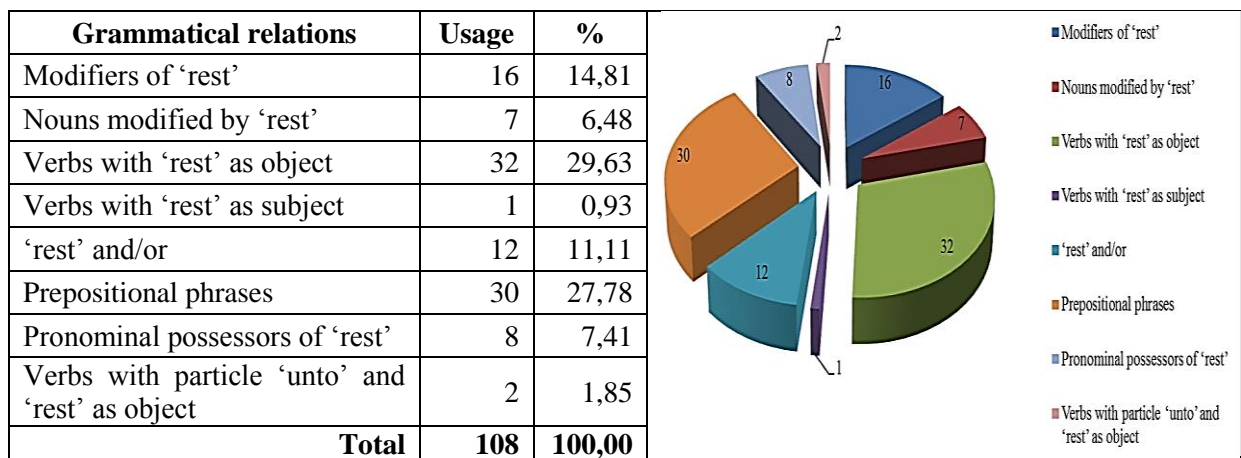


Figure 7: Grammatical relations of ‘rest’

The smallest in number is grammatical relations of ‘health’ (only 20 relations which are grouped into four types): verbs with ‘health’ as subject – 6; ‘health’ and/or – 1, prepositional phrases – 5, ... is a ‘health’ – 8. Figure 8 provides information on this classification.

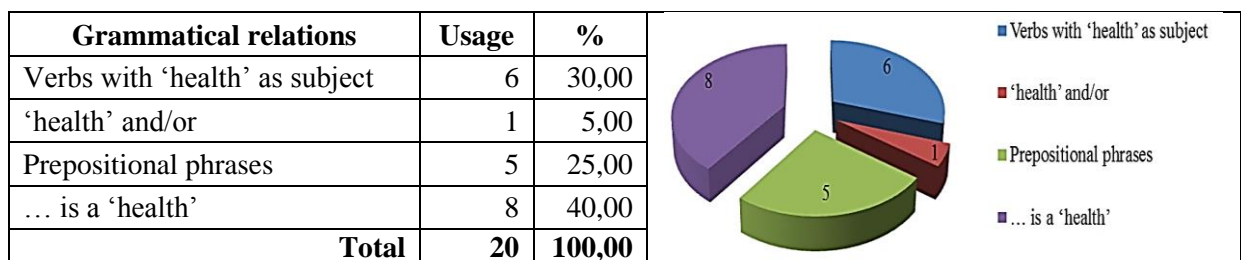


Figure 8: Grammatical relations of ‘health’

Here are some examples of grammatical relations of ‘health’:

There is that speaketh like the piercings of a sword.

But the tongue of the wise **is health**. [16, p. 1066]; Sweet to the soul, **and health** to the bones [16, p. 1074].

It shall **be health to** thy navel, And marrow to thy bones [16, p. 1052].

The last relations are of ‘joy’ and they are presented in Figure 9. Eight groups are singled out here (139 relations in total: modifiers of ‘joy’ – 8, nouns modified by ‘joy’ – 1, verbs with ‘joy’ as object – 17, verbs with ‘joy’ as subject – 4, ‘joy’ and/or – 21, prepositional phrases – 79, pronominal possessors of ‘joy’ – 6, ... is a ‘joy’ – 3).



Let us consider some examples of grammatical relations of ‘joy’:

Then the people rejoiced, for that they offered willingly, because with a whole heart they offered willingly to the LORD; and David the king also rejoiced with **great joy** [16, p. 1301].

The Jews had light and **gladness, and joy and honour** [16, p. 1195].

The humble also shall increase **their joy** in the LORD, And the neediest among men shall exult in the Holy One of Israel [16, p. 603].

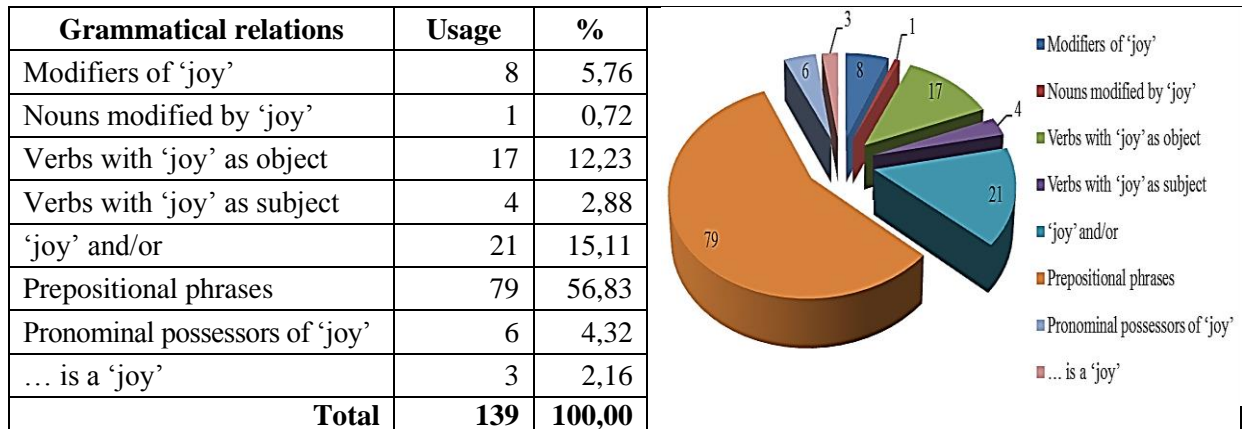


Figure 9: Grammatical relations of ‘joy’

## 5. Conclusions

The results of the research have shown that public health played an important role for people back in history. In the Hebrew Bible/Old Testament we came across with many examples of health issues.

**Hypothesis 1** verifies that the applied methodological approach of modelling is helpful in singling out the most appropriate lemmas denoting public health: *life, blessing, peace, health, clean, unclean, rest* and *joy*. The results showed that ‘life’, ‘peace’, ‘rest’, ‘unclean’, ‘joy’ and ‘clean’ are the most frequent lemmas to denote health. The fact that the lemma ‘health’ was used only nine times (0, 77 %) was surprising. This hypothesis was tested by a comparative analysis of collected data using a statistical approach.

**Hypothesis 2** proves to outline grammatical relationship of each lemma to the most typical combinations (collocations and other words in its surrounding). Nine grammatical relations were used in the category with ‘life’.

Prepositional phrases, pronominal possessors of ‘life’ and verbs with ‘life’ as object are the greatest in number. The least occurring combinations are possessors of ‘life’ (0,63 %), adjective predicates of ‘life’ (0,42 %) and verbs with particle ‘away’ and ‘life’ as object (0,42 %). Lemma ‘blessing’ creates eight relations in the corpus. The most frequent among them are prepositional phrases (39,47 %), verbs with ‘blessing’ as object (17,11%) and ‘blessing’ and/or (13,16 %). Verbs with ‘blessing’ as subject (5,26 %), nouns modified by ‘blessing’ (3,95 %) and verbs with the particle ‘away’ and ‘blessing’ as object were among the least found in that category. Search with lemma ‘peace’ showed slightly different results. Prepositional phrases (35,69 %), verbs with ‘peace’ as object (24,03 %) and pronominal possessors of ‘peace’ (17,31 %) were among the once which are used the most. However, verbs with particle ‘away’ and ‘peace’ as object (0,35 %) and phrases ‘is a peace’ (0,71 %) and ‘peace is’ (0,35 %) were used the least. It should be noted that lemma ‘unclean’ (175 times) was in advantage comparing to ‘clean’ (93 times). Grammatical relations of verbs before those lemmas prevailed in both categories. The lemma ‘rest’ appears to be one of the most important in the concept of public health, particularly when it comes to prevention measures. Verbs with ‘rest’ as object (29,63 %), prepositional phrases (27,78 %) and modifiers of ‘rest’ (14, 81 %) occurred the most. Verbs with particle ‘unto’ and ‘rest’ as object (1,85 %) and verbs with ‘rest’ as subject (0,93%) came the last. Another lemma ‘joy’ had similar results with lemma ‘life’.

This was prepositional phrases (56,83 %) and verbs with ‘joy’ as object (12,23 %) which occurred the most frequently. Grammatical relation of ‘joy’ and/or (15,11 %) was of great number in the category of ‘joy’. However, ‘life’ and/or had only 2,1 % in its category.

The lemma 'health' combined 20 grammatical relations and was the smallest in number. Verbs with 'health' (30 %) and the phrase 'is a health' (40 %) came the first in that category. The very lemma 'health' and/or was used only once which was 5 % of the total number in the group.

These findings suggest that further research should be conducted to access and research public health at a more advanced level to see the query type not only at the level of a lemma or a phrase, a word and a character. Text type analysis is another way of analysing public health vocabulary.

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