RIVISTA DELLA
FACOLTÀ DI SCIENZE MOTORIE
DELL'UNIVERSITÀ DEGLI STUDI DI PALERMO

ISSN: 1974-4331
VOL III, FASC. 1, SEZ. 1, 2010

PATTERNS OF USE OF ENGLISH SYNONYMOUS MEDICAL TERMS: THE CASE OF *DISEASE* AND *ILLNESS*. A CORPUS-BASED STUDY

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1. Abstract

It often happens that terms defined by dictionaries as synonyms have different patterns of use. An example of this phenomenon is represented by the terminological pair *disease/illness* in medical discourse. The behaviour of these commonly used terms will be an object of discussion in this study.

The work is divided into two main sections. The first part takes into account the information included in conventional dictionaries, both bilingual and monolingual, generic and specialized, in order to see if the terms in question are described as perfectly interchangeable or as having different uses depending on the context. Some dictionaries highlight the use, both specific and generic, respectively of *disease* and *illness*, but limited information about frequency, collocational and contextual preferences is provided. The second part of the work is represented by two corpus-based studies. In the first corpus, made up of 30 research article texts, the frequency of *disease* and *illness*, as well as collocates and patterns of use, are investigated. In the second additional corpus, made up of other 20 research articles texts, the aim of the analysis is to find out if an association exists between the use of *disease* and contexts where *specific* pathological conditions are dealt with, and between *illness* and contexts having pathological conditions *in general* as a subject.

The work intends to draw attention to the enormous resources that corpus linguistics can offer to lexicographic research.

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2. Introduction

Corpus-based linguistic investigations have achieved growing importance over the last few decades. Corpora allow researchers to observe and describe linguistic phenomena in a way that was not possible in the past with traditional approaches to language. Thanks to the extraordinary advances in information science technology and to the use of sophisticated electronic tools for linguistic analysis, today large amounts of authentic data are investigated quickly and accurately by means of a quantitative approach. In this way linguists are offered the possibility to make generalizations about several aspects of language which are not based upon personal intuitions. Moreover, the capability of modern softwares to retrieve and study words, phrases or even large pieces of text in context and not in isolation has enriched linguistic research with information about language use and grammatical behaviour of words with unprecedented results.

Corpora represent a very important source of information for learners, who, however, most times turn to the consultation of printed dictionaries. These are of course indispensable tools for language learning, but also have several important shortcomings. Bowker and Pearson (2002:15) highlight some of the main limitations of printed dictionaries in helping users with specialized language. In addition to the fact that dictionaries "go out of date very quickly", as by the time a dictionary is compiled and printed a language has acquired new terms, one of the most severe limitations is the size of dictionaries. Since many users prefer to have easy-to carry dictionaries, most books contain limited information about terms, and the information lexicographers choose to include does not always meet LSP users' needs. Moreover, Bowker and Pearson (2002:16) draw attention to one of the most critical features of printed dictionaries, that is the fact that they are not fulfilling in giving information about how terms are used in context. Printed dictionaries, in fact, generally provide the meanings of terms but do not say anything about collocates, that is other words which often associate with those which are the object of investigation.

Given the importance of contextualizing words and providing information about their usage, lexicographic research has recently paid more attention to corpora analysis for dictionary project purposes.[1]

Biber et al. (1998:24) identify six major types of research questions in corpus-based lexicographic investigations:

1. meanings associated with a particular word (traditional focus of lexicography);
2. the frequency of a word relative to other related words;
3. non-linguistic association patterns of a particular word (registers, historical periods, dialects, and so forth);

[1] Descriptions of how corpora are used in lexicography today are offered by Pulcini (2008), and Hunston (2002: 96-108).

4. common collocates of a particular word, and distribution of collocational sequences across registers;
5. distribution of the senses and uses of a word;
6. use of seemingly synonymous words and their distribution in different ways.

As far as the last issue is concerned, Biber et al. (1998:24) state:

> Languages have many words that are similar, and dictionary definitions often characterize such words as identical or "synonymous" in meaning. The patterns of use for these words, however, are often very different. Investigating the use and distribution of synonyms in a corpus allows us to determine their contextual preferences, associated with other collocates or associated with register differences.

In this study the pattern of use of the two medical terms *disease* and *illness* will be an object of investigation.

3. The case of disease and illness

Disease and *illness* are certainly among the most frequently used terms in medical language. Many dictionaries consider them as synonyms, even though *disease* is often described as having a specific use and *illness* a more general one. In this study several dictionaries were consulted in order to find out whether an actual difference between the two terms could emerge from definitions and from possible usage examples. To this purpose bilingual generic and specialized dictionaries, and monolingual generic and specialized dictionaries were consulted. Generic bilingual dictionaries were consulted in order to see what Italian equivalents were registered and whether any examples contextualizing both terms could be found. More in general, both generic bilingual and monolingual dictionaries were taken into account in this study basically because *disease* and *illness* are terms which do not belong only to medical discourse, but to common language as well. As far as specialized dictionaries are concerned, these were consulted to find out if any difference of use could be straightforwardly deduced from the definitions of the terms in question, as well as, of course, from any related examples.

3.1. Consulting generic bilingual dictionaries

The following is what can be read with regard to *disease* and *illness* in the Garzanti (2002) and Picchi (1999) bilingual dictionaries:

Disease malattia ***Occupational disease***, malattia professionale. sin. Illness Confrontiamo *disease* e *illness*. Entrambi i termini hanno lo stesso significato e spesso sono usati uno per l'altro. Si può dire però che disease indichi la malattia specifica che si prende, si trasmette, si cura ed è oggetto di studio da parte dei medici: *This plant suffers from a rare disease*, Questa pianta soffre di una rara malattia; *infectious disease*, malattia infettiva; *skin disease*, malattia della pelle. *Illness* è più generico e in genere è riferito a persone: *She died after a long painful illness*, Morì dopo una lunga e penosa malattia.[2]
Illness malattia, malanno. sin. disease

Table 1. Extract from Garzanti (2002)

Disease 1. malattia, morbo Ex: Alzheimer's disease, morbo o malattia di Alzheimer.
2. malattia, morbo, male, vizio
Illness malattia, infermità, malanno, disturbo.

Table 2. Extract from Picchi (1999)

As can be seen from table 1, the only Italian equivalent which is registered for *disease* is *malattia*, unlike what happens in table 2, where *morbo* can also be found with regard to eponyms (*Alzheimer's disease*). Moreover, in table 1 it is first said that *illness* and *disease* have the same meaning, and then that the terms are used in a different way, *disease* having a more specific meaning (it is used to refer to conditions which are caught, transmitted, treated, and which are also an object of attention by physicians), while *illness* is more generic and is usually used when dealing with people (*she died after a long painful illness*).

Finally, looking once again at table 2, *male* and *vizio* are registered as additional Italian equivalents for *disease*, but there is no trace of them in table 1.

[2] The following is a comparison between *illness* and *disease*. The two terms have the same meaning and are often used interchangeably. Yet, *disease* refers to a specific condition which is caught, transmitted, treated, and which is studied by physicians. Ex: *This plant suffers from a rare disease*; *infectious disease*; *skin disease*. *Illness* is more generic and is usually used with reference to people: *She died after a long painful illness*; Morì dopo una lunga e penosa malattia. (My own translation).

As far as *illness* is concerned, the Italian equivalents registered in table 1 are *malattia* and *malanno*, which can also be found in table 2 next to *infermità* and *disturbo*.

The definitions reported above do not, however, cast sufficient light on the difference of use between *illness* and *disease*, firstly because the only information which can be inferred is that *disease* refers to a specific pathological condition, and *illness* to a generic pathological one which may not necessarily coincide with a sheer condition of 'poor health', and secondly because there are not enough examples clarifying this potential difference.

3.2. Consulting specialized monolingual dictionaries

Dorland's Illustrated Medical Dictionary (2007) defines *disease* "any deviation from or interruption of the normal structure or function of a part, organ, or system of the body as manifested by characteristic symptoms and signs; the aetiology, pathology, and prognosis may be known or unknown". At the entry *illness*, the only information provided is that the term is a synonym of *disease*. Two examples for *illness* are registered, *folk illness* and *psychosomatic illness* (or *somatoform disorder*). The first is "a condition in which a person has symptoms that are not identifiable with usual modern categories of disease", and whose name is explained with the fact that in many societies this condition and other which are similar "are felt to be treatable by folk healers using techniques such as prayer, rituals, and laying on of hands"; the second is a type of condition belonging to the group of mental disorders, "in which physical symptoms suggest the presence of a medical disorder but are not fully explained by a general medical condition".[3]

In *Medline Plus Medical Dictionary*: (www.nlm.nih.gov/medlineplus/mplusdictionary.html), one of the most consulted dictionaries on the Internet, *disease* and *illness* are defined as follows:

> **disease** an impairment of the normal state of the living animal or plant body or one of its parts that interrupts or modifies the performance of the vital functions, is typically manifested by distinguishing signs and symptoms, and is a response to environmental factors (as malnutrition, industrial hazards, or climate), to specific infective agents (as worms, bacteria, or viruses), to inherent defects of the organism (as genetic anomalies), or to combinations of these factors**:** syn**.** illness, sickness; called also *morbus*
>
> **illness** an unhealthy condition of body or mind**:** syn. sickness

The results of the investigation on *disease* and *illness* as carried out in the two specialized monolingual medical dictionaries mentioned so far do not prove to be fulfilling enough to the purpose of this work. Neither usage examples nor any explanation of the possible semantic difference between the two terms are offered. Undoubtedly, the terms chosen for the analysis are so frequently used in

[3] For investigations about the use of *disorder* in the sense of *illness*, see Gavioli (2000).

medical language that it would not be feasible for dictionaries to provide a sufficiently significant number of examples to allow deducing the possible semantic preferences of *disease* and *illness* in medical language. However, the need for a deeper investigation on the issue in question is felt as necessary, especially when running into such definitions as that provided by the online encyclopaedia *wikipedia* (www.wikipedia.org), where, with regard to *illness* (also compared to *sickness*), we read:

> Illness and sickness are generally used as synonyms for disease. However, this term is occasionally used to refer specifically to the patient's personal experience of his or her disease. In this model, it is possible for a person to be diseased without being ill (to have an objectively definable, but asymptomatic, medical condition), and to be ill without being diseased (such as when a person perceives a normal experience as a medical condition, or medicalizes a non-disease situation in his or her life).

In "it is possible for a person to be diseased without being ill", and "to be ill without being diseased", the adjectives "diseased" and "ill" have a different semantic value, that is diseased refers to a person who is actually in a state of 'lack of health', that is he or she is in a medical condition which is "objectively definable", while the term *ill* can also be used to designate a person who considers himself or herself in a condition of 'lack of health', but is not actually so. Thus, *ill* has a subjective value, that is it can be used to refer to *how* a person perceives his or her state of being, while *diseased* has an objective value; it is used to refer to *actual* states of pathological conditions, free from possible personal perceptions.

3.3. Consulting other dictionaries

To the purpose of this study, and in order to have a larger view of definitions and examples offered by dictionaries, the generic monolingual *Oxford English Dictionary* (2000), *Merriam-Webster Online* (www.m-w.com), and the bilingual specialized *Gould-Chiampo* (1998) dictionary were also consulted. The following is what was found in these works:

a. *Oxford*

A **disease** is a particular illness with a name, or an illness which affects a particular part of the body:
- Measles is the most devastating of all the major childhood diseases.
- A healthy diet and regular exercise can help prevent heart disease.

Illness is a general word for a period of not being in good health:
- He died unexpectedly after a short illness
- The doctor asked whether she had a history of any serious illness

b. *Merriam-Webster Online*

Disease an impairment of the normal state of the living animal or plant body or one of its parts that interrupts or modifies the performance of the vital functions, is typically manifested by distinguishing signs and symptoms, and is a response to environmental factors (as malnutrition, industrial hazards, or climate), to specific

infective agents (as worms, bacteria, or viruses), to inherent defects of the organism (as genetic anomalies), or to combinations of these factors**:** syn**.** illness, sickness - called also *morbus*

Illness an unhealthy condition of body or mind**:** syn. sickness

c. *Gould-Chiampo*

Disease *n*. **malattia.** The failure of the adaptive mechanisms of an organism to counteract adequately the stimuli or stresses to which it is subject, resulting in a disturbance in function or structure of any part, organ, or system of the body. A response to injury; sickness or illness.

Illness *n.* malattia; indisposizione. **1**. The state of being ill or sick. **2**. A malady, sickness, disease, disorder.

3.4. Results

On the basis of the data obtained from the consultation of the dictionaries mentioned so far about the use of *disease* and *illness* it seems that the former is likely to occur in contexts dealing with pathological conditions which affect a specific part of the body (examples mentioned above are "heart disease", "eye disease", "kidney disease" or "disease of the kidney", while the latter has a more generic use (e.g. "various illnesses", "short illness", "because of illness"), that is it is used in contexts where there is no reference to a *specific* pathological condition.

4. Corpus-based analysis

At this stage of the research, the need for an evidence-based analysis of authentic texts was felt, that is a corpus-based linguistic investigation in order to see how the terms chosen for this study are actually used in authentic medical English language and what "contextual preferences" they show to have. To this purpose, a corpus of 109,822 words from 30 English texts was collected. All texts are research articles drawn from the BMJ (British Medical Journal) online, covering the period from 2007 to 2009.[4] The average number of words per text is 2,929, ranging from 638 words to 5,220. All sections were inspected in the texts, except authors' names, titles, abstracts, acknowledgements, and references. The corpus covers a wide number of different medical branches, including cardiology, dermatology, neurology, internal medicine, intensive care, oncology, orthopaedics and rheumatology, surgery, obstetrics, and infectious diseases. The linguistic tool used for the analysis was WordSmith (version 5.0), a software producing concordances in the Key Word in Context (KWIC) format.

The study aimed at the investigation of the two main following issues:

a) frequency of *disease* and *illness* in the semantic areas explored;
b) collocates associated with *disease* and *illness*.

[4] The English texts selected for this study were drawn from the following issues: 334 (May 2007), 335 (June, July, and August 2007), 336 (February, March, and April 2008), 338 (January, February, and May 2009), and 339 (October 2009).

Disease showed 194 occurrences (accounting for 85.5%), while *illness* showed 33 occurrences (accounting for 14.5%).[5]

Disease showed a tendency to collocate mostly with nouns and adjectives respectively designating and pertaining to organs. "Heart" is the top collocate noun, with 24 occurrences, followed by "cuff" with 15 occurrences (although concentrated in a single text), "kidney" with 9 occurrences, "bowel" with 5 occurrences, and "liver" with 3 occurrences.[6]

The top collocate adjective is "meningococcal" with 21 occurrences (although concentrated in a single text), followed by "cardiovascular" with 7 occurrences, "vascular" and "chronic" with equal number (6) of occurrences, "pulmonary" and "histological" with equal (5) number of occurrences, and "cerebrovascular" with 4 occurrences.

Nouns	*Occurrences*
Heart	24
Cuff	15
Kidney	9
Bowel Grade	5
Liver	3
Total	61

Table 3. Left-collocate nouns of *disease* in the selected corpus from the BMJ (109,822 words).

Adjectives	*Occurrences*
Meningococcal	21
Cardiovascular	7
Chronic Vascular	6
Pulmonary Histological	5
Cerebrovascular	4
Total	54

Table 4. Left-collocate adjectives of *disease* in the selected corpus from the BMJ (109,822 words).

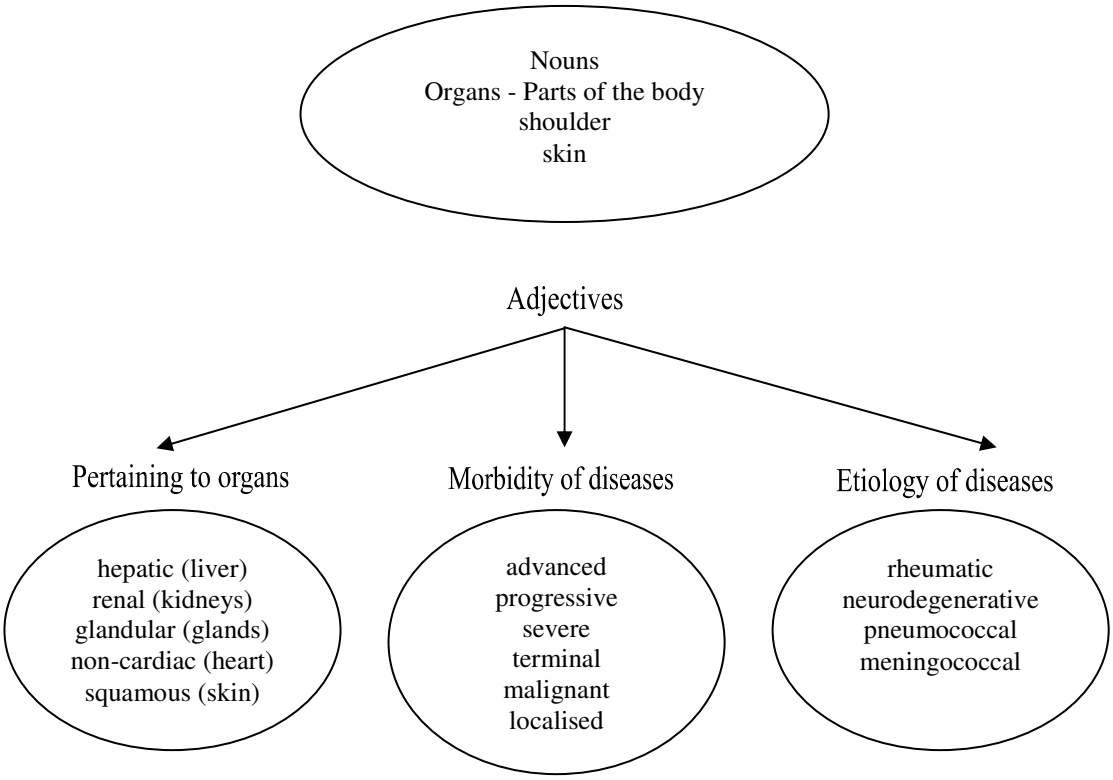
4.1. Results

The results showed that 31.4% of left-collocates of *disease* are nouns mainly representing names of organs. Nouns not representing names of organs are "grade", with 5 occurrences, which is synonym of "level" of disease, "reflux" (1 occurrence), which was not included in table 3, and "cuff", which although not being an organ, is a part of the body; 27.9% of left-collocates was represented by adjectives pertaining organs and tissues (e.g. "pulmonary" refers to lungs), except "chronic", which describes the course of a disease (or its rate of onset and

[5] The concordances of *disease* and *illness* performed by WordSmith are fully shown in Appendix 1 of this work.

[6] Nouns and adjectives with less than 3 occurrences were not included in table 3 and 4. They will be mentioned later in the text.

development); 21.7% is represented by articles and prepositions ("the", "a", "on", "for", "in", "to", etc.); 12.3% is made up of adjectives and (a few) nouns, which, although recurring most times only once, were considered important as they may contribute to giving information about the semantic preferences of *disease* in medical discourse. These terms were divided as follows:



The remaining terms are represented by the adjectives "future", "resultant" and "known", which owing to their non-specialized nature were defined here as 'conversational' terms, and by the adjectives "pilonidal", an anatomo-pathological definition, and "communicable", referring to the type of disease. The noun "reflux" and the names "Osgood-Schlatter" are, respectively, a physiopathological definition and an eponym.[7]

As far as the concordance of *illness* is concerned, the results showed that, firstly, this term mainly associates with adjectives (accounting for 60.7%)[8], and, secondly, that these adjectives refer to different semantic areas. "Psychotic", for instance, describes the 'type' of illness, in this case with reference to the psychiatric area; "prodromal" and "unstable" are terms referring to the 'development' of a pathological condition; "medical" designates the classification

[7] The remaining 6.7% is mainly represented by punctuation marks (full stops and commas), thus not giving any meaningful information about collocates of *disease*.
[8] The remaining 39.3% is mainly represented by prepositions ("after", "of", "to", etc).

of diseases according to treatment, while "critical" and "severe" belong to the sphere of 'morbidity' of pathological conditions. Though the occurrences of *illness* are not, perhaps, numerically enough to allow drawing generalizations, nevertheless a more general use of the term seems to be suggested by its concordance in comparison with that of *disease*.

5. Contextual preferences for disease/illness

To complete the work done so far in this study, additional research was carried out in order to investigate if what was registered in dictionaries about the association of specific pathological conditions with *disease* rather than with *illness* could be confirmed by a corpus-based analysis. To this purpose, a different corpus was analysed.[9] It is made up of 20 research article texts from the BMJ online, accounting for 95,288 words, and covering the period of time 2006-2010. The average number of words per text is 4,413, ranging from 2,365 to 6,461.[10] The texts deal with several pathological conditions, including measles, pneumonia, diabetes, obesity, multiple sclerosis, cirrhosis, and many others.

In order to carry out this analysis, it was necessary to investigate larger strings of text than the short fragments of word sequences to the left and right of the chosen keyword in each line. More precisely, chunks of texts were inspected every time any pathological condition was mentioned.

5.1. Results

The investigation of the corpus described above showed that in texts dealing with specific conditions (that is those with a name) or with conditions affecting a specific part of the body the term used is *disease*, while *illness* most often occurs in contexts where the condition "of not being well" is dealt with, without reference to any specific pathological condition.[11] However, the analysis of the corpus revealed another important datum which was not found in any traditional dictionary consulted for this study, that is the use of *illness* with the same semantic value as *disease*; in other words, the use of *illness* as a synonym of *disease* also in contexts where there is reference to specific pathological conditions. More precisely, *illness*, which occurs 41 times in the corpus, shows 36 occurrences (accounting for 87.9%) revealing a general use of the term, and 5 occurrences (12.1%) where the term refers to specific pathological conditions ("myalgic encephalitis", "asthma", "diabetes", "heart failure" and "H1N1 influenza").[12]

[9] In order to carry out this research it was thought it right to build another corpus with different design criteria which took into account texts about specific pathological conditions.

[10] The English texts collected for this study were drawn from the following issues: 332 (January and March 2006), 335 (August 2007), 336 (February and June 2008), 337 (July 2008), 339 (July, September, and December 2009), 340 (February and March 2010).

[11] Some text fragments from the concordance of *illness* in the second corpus are included in Appendix 2 (b).

[12] The texts fragments where these pathological conditions are mentioned in association with *illness* can be found in Appendix 2 (b), extracts 6 and 7.

A look at the entry *illness* in the corpus-based *Collins COBUILD English Language Dictionary* (2001) seems to confirm two uses of the term, one of which describes *illness* as a synonym of *disease*:

> **Illness 1** is the experience of being ill for a period of time. EG During his last illness we only saw him twice…People can recover from the symptoms of mental illness.
>
> **Illness 2** An illness is a particular disease that people can suffer from, such as cold, measles, or pneumonia. EG She died of a mysterious illness…Finally a doctor diagnosed the illness…cures for various illnesses.[13]

Collin's Dictionary of Medicine (2001), another corpus-based dictionary, also registers the two different uses of *illness*:

> **Illness (a)** state of being ill, of not being well;
> - His illness makes him very tired;
> - Most of the children stayed away from school because of illness
>
> **(b)** type of disease;
> - He is in hospital with an infectious tropical illness;
> - Scarlet fever is no longer considered to be a very serious illness[14]

Disease, occurring 283 times, is always found in contexts where specific pathological conditions are dealt with ("diabetes", "psoriasis", "whooping cough", etc.).[15]

6. Conclusions

The analysis of the small medical corpora built for this work does not claim to give any conclusive data. The aim of the investigation was only that of identifying the collocational and contextual preferences of *disease* and *illness*, two very common medical terms which are often described as synonyms by dictionaries, though having different patterns of use. Dictionaries, in fact, though representing indispensable source of information about the meaning of words, do not generally provide enough usage examples and information about collocates or semantic preferences of terms. Not even information about the frequency of a given term is offered.

From the analysis of the first corpus it can be inferred that *disease* shows a clear tendency to (a) occur more frequently than *illness*, and (b) collocate with nouns and adjectives referring to organs and parts of the body. *Illness* shows a tendency to collocate almost exclusively with adjectives, with these belonging to

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[13] As far as *disease* is concerned, *Collins COBUILD English Language Dictionary* (2001) registers: **Disease** An illness in people, animals or plants which is caused by bacteria or infection, rather by an accident. **EG**…women and children ravaged by disease…I have a rare eye disease… …infectious diseases.

[14] *Collin's Dictionary of Medicine* (2001) defines *disease* **"**illness (of people, animals, plants, etc.) where the body functions abnormally";
- She is suffering from a very serious disease of the kidneys or from a serious kidney disease;
- He is a specialist in occupational diseases or in diseases which affect workers.

[15] See Appendix 2 (a).

different semantic areas. None of the left collocates of *illness* refers to organs or parts of the body.

Another corpus-based analysis was carried out in a different corpus in order to investigate if what was registered in dictionaries about the use of *disease* in contexts dealing with specific pathological conditions could be confirmed. The analysis of the corpus revealed a clear prevalence of *disease* in such contexts, while *illness* was prevalent in more general contexts. However, the investigation of the corpus revealed the use of *illness*, though in a low percentage, as a synonym of *disease* also in contexts where specific pathological conditions were dealt with.

It can be stated that studies like the one carried out here can prove useful, for instance, from a translating point of view. In the case of *disease* and *illness*, if on the one hand both terms can be rendered into Italian as "malattia" (or often "morbo" in the case of *disease* used in eponyms), on the other one when translation is *into* English the semantic preferences and collocational patterns of either terms should be known.

Finally, with regard to the role and importance of dictionaries within ESP, it is worth saying that even though they are no doubt a valuable information source for learners to get definitions and meanings of terms, they should also provide information about frequency of terms, as well as about context, and give more room to usage examples. This entails two major requisites, the necessity for dictionaries to be corpus-based, and the need for them to have an online format. The latter would also allow entries to be continually enriched and updated with the latest research outcomes.

Examples of major corpus-based dictionaries (for common English) are *Collins COBUILD English Language Dictionary*, created after a project set up by John Sinclair, and *Longman Dictionary of Contemporary English*.

A bilingual English-Italian/Italian-English corpus-based specialized medical dictionary is still lacking. It would certainly enrich Italian lexicographic research within ESP studies and be a valuable aid for translating purposes as well.

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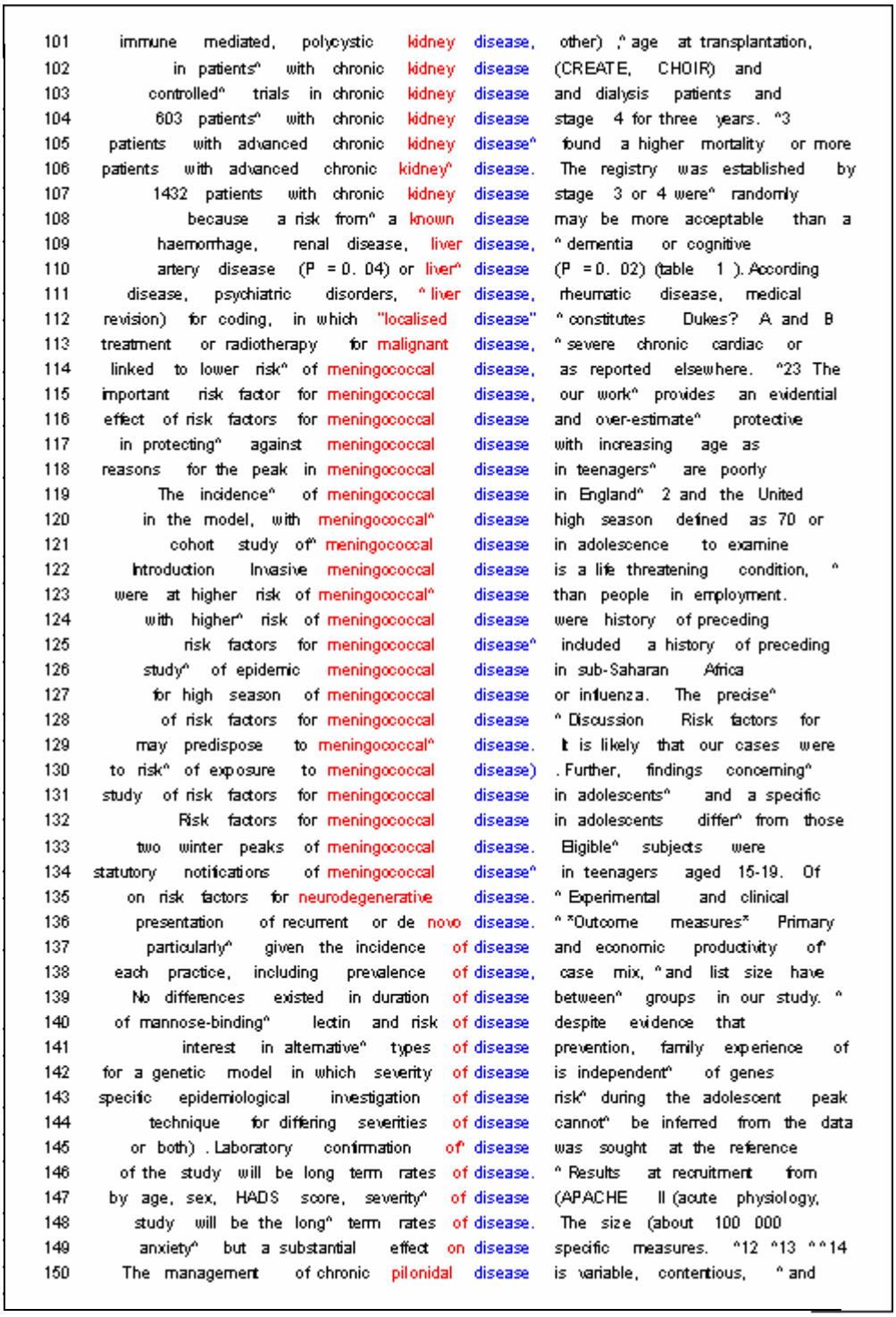
15. *Wikipedia* (www.wikipedia.org)

Appendix 1

Figure 1. Concordance of *disease* in the corpus from the BMJ (109,822 words), sorted by the first word to the left.

N	Concordance
1	sex]+[0.8618xcerebrovascular^ disease]+[3.2636xcardiogenic
2	the Kujala Patellofemoral^ Scale, a disease specific validated disability scale
3	Introduction Pilonidal sinus is a disease that most commonly arises in
4	If a participant reported having had a disease diagnosed^ by a doctor for six
5	Dukes? A and B and "advanced disease" constitutes^ tumours infiltrating
6	threaten immunisation^ targets and disease control should this concern
7	The association of preterm birth and disease has not been described^
8	hypertension, coronary^ artery disease, percutaneous transluminal
9	diabetes, and coronary artery disease^ were identified as risk factors
10	less likely to have coronary artery disease (P = 0.04) or liver^ disease (P =
11	intraepithelial^ neoplasia grade 2, as disease of this severity or greater was^
12	concerns about autism and bowel disease despite a balanced
13	link between MMR vaccination, bowel disease,^ and autism (50% considered it
14	concerns about autism and bowel disease.^ The most important perceived
15	concerns about^ autism and bowel disease (78%, /v/ 27%), and fear of
16	instruments: the inflammatory bowel^ disease questionnaire (UKIBDQ),
17	previous^ two weeks, any non-cardiac disease likely to limit survival^ to two
18	to1.51) and^ death from cardiovascular disease or hospital admission for^ heart
19	based studies of cardiovascular^ disease in British towns representing all
20	with pre-existing cardiovascular disease,^42 more research is^ needed to
21	and determinants^ in cardiovascular disease (MONICA) criteria,^21 using
22	of their risk of cardiovascular^ disease.^9 Only one qualitative study
23	to be aware of the risk of cardiovascular disease associated^ with impaired
24	developing diabetes and cardiovascular disease.^ The lack of anxiety associated
25	for dialysis status, cerebrovascular disease, peripheral vascular disease,
26	?80 years, female sex, cerebrovascular disease,^ cardiogenic shock, urgent
27	for dialysis status, cerebrovascular disease, peripheral vascular disease,
28	dialysis^ status, cerebrovascular disease, peripheral vascular disease,^
29	be related to diagnosis^ of a chronic disease (or the treatment in terms of
30	in analysis*?Age, sex, modified chronic disease^ score, prescription drugs
31	account demographic^ factors, chronic disease, psychosocial risk factors in the
32	models for age,^ education, chronic disease, family status, health behaviour,^
33	him or her^ as having a chronic disease.^ /Health behaviour/ We divided
34	sex, education, family status, chronic disease, and health^ behaviour.^15 The
35	illness.^ Consultants in communicable disease control, clinicians, the^ national
36	renal, and retinal complications. Disease onset^ may occur up to 12
37	Non-operative treatment for rotator cuff disease primarily consists^ of active
38	million, to refer patients with rotator cuff disease^ to the outpatient clinic of the
39	and mechanisms of pain in rotator cuff disease^ are not known.^3
40	of steroid^ injections for rotator cuff disease is unconvincing. Conclusions^ of
41	impingement syndrome^ or rotator cuff disease is the most frequent
42	in patients^ with chronic rotator cuff disease. They found a moderate
43	corticosteroid^ injections for rotator cuff disease.^9 ^11 Alvarez et al compared^
44	corticosteroid injections^ for rotator cuff disease. Limited evidence exists for
45	strategy for patients with rotator cuff disease. Better outcome^ in terms of
46	corticosteroid injection in^ rotator cuff disease.^ *Comparison with existing
47	by the duration of rotator cuff disease. The favourable result^ of
48	short term improvement in rotator cuff disease. Ultrasound^ guided injection of
49	bursa in patients with rotator cuff disease.^ We used a double blind
50	injections in patients with rotator cuff disease, we did a randomised^ controlled

51	in patients with rotator cuff	disease.	We^ did not find significant
52	0-21 each for anxiety and depression.	Disease	specific^ worry was measured
53	It addressed the question: does	disease	incidence, ^ and possibly other
54	were used: "pilonidal^ sinus" ,"fistula" ,"	disease"	, and "natal cleft" . We hand
55	improvements in^ health, risk factors for	disease,	or even overall levels of^
56	fitness, other risk factors^ for	disease,	health, and wellbeing; evidence
57	neither necessary nor sufficient^ for	disease.	Its significance was unchanged
58	tolerance/ Perceptions^ of future	disease	susceptibility Intention to
59	or undifferentiated by age, gender, ^	disease	or organ. This includes
60	detection of histological^ glandular	disease,	although this result is limited by
61	more cases of histological^ high grade	disease	than did conventional cytology
62	more cases^ of histological high grade	disease	than did conventional cytology^
63	more cases of histological^ high grade	disease	per 1000 women screened than
64	cases (21%) of histological^ high grade	disease	were detected (table 4Go). The
65	more cases of histological^ high grade	disease	and required 170 (380 minus
66	in adults with ischaemic heart^	disease.	^w10 None found a significant
67	service framework for coronary heart^	disease.	^1 Recently it has been
68	(adults with^ ischaemic heart	disease^	w10 or type 2 diabetes^ w23).
69	congestive heart failure, ^ valvular heart	disease,	arteriosclerosis and
70	reductions in the risk of coronary heart	disease	of^ up to 75% or more. ^2 Most
71	Secondary prevention of coronary heart	disease	is an important^ component of
72	after admission, who had valvular heart	disease	(defined as^ having inpatient
73	on diagnoses of coronary heart	disease.	We used^ questionnaires in
74	intervention for^ patients with heart	disease	was effective, ^w10 but studies
75	supplemented by new coronary^ heart	disease	cases and attenuated by death
76	vascular disease, ^ coronary heart	disease,	heart failure, cholesterol
77	use^ among prevalent coronary heart	disease	cases at each time point; ^ the
78	reported diagnoses of coronary^ heart	disease.	Self reported use of medication
79	diseases? notably, ^ coronary heart	disease,	type 2 diabetes, and cancer of
80	the risk of recurrent coronary heart	disease	in older^ patients, particularly by
81	(that is, hypertension, ischaemic heart	disease,	pulmonary embolism, ^
82	diseases, coronary heart^	disease,	heart failure, mean arterial
83	heart disease. ^20 Coronary heart	disease	was defined^ by using the
84	(self reported) ," and coronary heart	disease.	^20 Coronary heart disease was
85	vascular disease, coronary heart	disease,	heart failure, cholesterol
86	cholesterol, diabetes, ^ coronary heart	disease,	and use of psychotropic drugs
87	vascular disease, coronary heart	disease,	heart failure, cholesterol
88	cholesterol, ^ diabetes, coronary heart	disease,	and use of psychotropic drugs. ^
89	classified as having coronary heart	disease	if they had^ unstable angina or a
90	clearance <40 ml/min, hepatic	disease,	^ anaemia *Agents
91	133 cases (24%) of histological	disease	of cervical^ intraepithelial
92	detects more high grade histological^	disease	than does conventional
93	the detection of high grade histological^	disease	by 1.3 cases per 1000 women
94	100 cases of high grade histological	disease	detected^ by imager read
95	100 cases of high grade histological^	disease	detected by imager read
96	York Heart Association class I or^ II	disease	(box) .^w7 Although not a
97	towards older teenagers^ 4 and a rise in	disease	due to serogroup^ C strains. ^5
98	York Heart Association class III or IV	disease	because^ of concerns about fluid
99	trials in patients with chronic kidney	disease	and^ haemodialysis patients in
100	patients with advanced^ chronic kidney	disease,	we consider that renal


101 immune mediated, polycystic kidney disease, other) ,^ age at transplantation,
102 in patients^ with chronic kidney disease (CREATE, CHOIR) and
103 controlled^ trials in chronic kidney disease and dialysis patients and
104 603 patients^ with chronic kidney disease stage 4 for three years. ^3
105 patients with advanced chronic kidney disease^ found a higher mortality or more
106 patients with advanced chronic kidney^ disease. The registry was established by
107 1432 patients with chronic kidney disease stage 3 or 4 were^ randomly
108 because a risk from^ a known disease may be more acceptable than a
109 haemorrhage, renal disease, liver disease, ^ dementia or cognitive
110 artery disease (P = 0. 04) or liver^ disease (P = 0. 02) (table 1). According
111 disease, psychiatric disorders, ^ liver disease, rheumatic disease, medical
112 revision) for coding, in which "localised disease" ^ constitutes Dukes? A and B
113 treatment or radiotherapy for malignant disease, ^ severe chronic cardiac or
114 linked to lower risk^ of meningococcal disease, as reported elsewhere. ^23 The
115 important risk factor for meningococcal disease, our work^ provides an evidential
116 effect of risk factors for meningococcal disease and over-estimate^ protective
117 in protecting^ against meningococcal disease with increasing age as
118 reasons for the peak in meningococcal disease in teenagers^ are poorly
119 The incidence^ of meningococcal disease in England^ 2 and the United
120 in the model, with meningococcal^ disease high season defined as 70 or
121 cohort study of^ meningococcal disease in adolescence to examine
122 Introduction Invasive meningococcal disease is a life threatening condition, ^
123 were at higher risk of meningococcal^ disease than people in employment.
124 with higher^ risk of meningococcal disease were history of preceding
125 risk factors for meningococcal disease^ included a history of preceding
126 study^ of epidemic meningococcal disease in sub-Saharan Africa
127 for high season of meningococcal disease or influenza. The precise^
128 of risk factors for meningococcal disease ^ Discussion Risk factors for
129 may predispose to meningococcal^ disease. It is likely that our cases were
130 to risk^ of exposure to meningococcal disease) . Further, findings concerning^
131 study of risk factors for meningococcal disease in adolescents^ and a specific
132 Risk factors for meningococcal disease in adolescents differ^ from those
133 two winter peaks of meningococcal disease. Eligible^ subjects were
134 statutory notifications of meningococcal disease^ in teenagers aged 15-19. Of
135 on risk factors for neurodegenerative disease. ^ Experimental and clinical
136 presentation of recurrent or de novo disease. ^ *Outcome measures* Primary
137 particularly^ given the incidence of disease and economic productivity of^
138 each practice, including prevalence of disease, case mix, ^ and list size have
139 No differences existed in duration of disease between^ groups in our study. ^
140 of mannose-binding^ lectin and risk of disease despite evidence that
141 interest in alternative^ types of disease prevention, family experience of
142 for a genetic model in which severity of disease is independent^ of genes
143 specific epidemiological investigation of disease risk^ during the adolescent peak
144 technique for differing severities of disease cannot^ be inferred from the data
145 or both) . Laboratory confirmation of^ disease was sought at the reference
146 of the study will be long term rates of disease. ^ Results at recruitment from
147 by age, sex, HADS score, severity^ of disease (APACHE II (acute physiology,
148 study will be the long^ term rates of disease. The size (about 100 000
149 anxiety^ but a substantial effect on disease specific measures. ^12 ^13 ^ ^14
150 The management of chronic pilonidal disease is variable, contentious, ^ and

N Concordance

151 treatment and management of pilonidal disease^ is required. Evidence is still
152 study of invasive pneumococcal disease^ by Nuorti et al.^49 However,
153 2 diabetes mellitus is a progressive disease, which can^ lead to considerable
154 vascular accident, chronic pulmonary disease, urinary incontinence,^
155 severe chronic cardiac or pulmonary disease (New York Heart^ Association
156 cancer, chronic obstructive pulmonary^ disease, peripheral vascular disease,
157 or chronic obstructive pulmonary^ disease, which do not require treatment
158 vascular accident, chronic pulmonary disease,^ urinary incontinence,
159 (ADS),^ the gastro-oesophageal reflux disease-health related quality^ of life
160 in patients with^ end stage renal disease treated by haemodialysis was
161 intracerebral haemorrhage, renal disease, liver disease,^ dementia or
162 led to declining coverage and resultant disease outbreaks in^ the United
163 disorders,^ liver disease, rheumatic disease, medical school affiliation,^ other
164 tendinopathy, Osgood-Schlatter^ disease, or other defined pathological
165 severely^ affected patients. More severe disease presumably indicates^ a greater
166 shock^ wave therapy for shoulder disease.^34 ^35 ^36 Thus, our results^
167 to severe discomfort or pain, skin disease associated^ with cold
168 histological high grade squamous^ disease than did manually read
169 is inappropriate?for^ example, terminal disease or patient choice?a patient^ may
170 with the first character indicating^ the disease area and later characters
171 tend to appear late in the course of the^ disease, and early surgery remains the
172 Awareness^ and understanding of the disease Perceived seriousness of the^
173 of severity they associated with the^ disease. All newly diagnosed patients
174 to several perceptions and factors: the^ disease having been discovered "at an
175 type 2 diabetes/ Perceptions^ of the disease (including perceived
176 and mortality associated with the^ disease, our systematic review found few
177 disease Ideas about the causes of the disease /After results^ of the oral
178 disease Perceived seriousness of the^ disease Ideas about the causes of the
179 the potential consequences^ of the disease to justify lifestyle change,
180 those^ eventually diagnosed with the disease.^6 ^ Although participants talked
181 high readings to progression of the disease.^ This association between self
182 being^ a good thing?enabling the disease to be detected at an^ early,
183 about^ their plans to control the disease; in some cases a diet-only^
184 expressed in their plans to control their disease^ seemed to be related to several
185 and their experiences of managing their disease.^20 ^21 ^22 ^23 ^ ^24 ^25
186 younger populations and^ therefore this disease has an economic impact. To
187 the alleles assumed to predispose^ to disease.^19 ^20 ^21 Another prediction of
188 pulmonary^ disease, peripheral vascular disease, psychiatric disorders,^ liver
189 disease, peripheral vascular disease, coronary heart disease, heart
190 disease, peripheral vascular disease,^ coronary heart disease, heart
191 techniques. Heart^ failure, vascular disease, and diabetes were defined by
192 disease, peripheral vascular disease, coronary heart disease, heart
193 for more advanced diabetes or vascular disease (or both).^w6 ^ Thus, treatment
194 lectin was not associated with disease. Immunisation^ was protective,

Figure 2. Concordance of *illness* in the corpus from the BMJ (109,822), sorted by the first word to the left.

N	Concordance
1	(compared with those diagnosed after^ illness)^7 ^8 and a lack of understanding
2	or had a psychotic illness^ or an illness with a prognosis of less than one
3	We reduced the time^ between illness and interview and used memory
4	in a patient with a clinically compatible illness.^ Consultants in communicable
5	rehabilitation requirements^ after critical illness has advanced since we designed
6	recovery and^ rehabilitation after critical illness is also required. Finally,^ the role
7	23 May 2005), as apparent flu-like illness or hangover^ may in fact be the
8	to hospital for an acute medical illness.^4 ^ ^13 These studies agreed
9	to intensive care or symptoms of illness.^ In the univariate matched
10	subgroups,^ which included severity of illness, chronic comorbidity, intensive^
11	undertaken for APACHE II severity of illness,^ APACHE II comorbidity,
12	may be related to the lower severity of illness^ in the patients in the second
13	may be reduced by the high severity of illness of patients treated^ in UK
14	the month before the case patient's illness, which was^ easier to do as their
15	data from the participants on preceding illness:^ symptoms of prodromal illness
16	disease were history of preceding illness,^ intimate kissing, being a
17	to report being unwell^ with a preceding illness in the fortnight before admission
18	(in 15-19 year olds).^ *Role of preceding illness* Independent biological risk
19	included a history of preceding illness and preterm birth. A^ preceding
20	of preceding illness. Preceding illness occurred in 53% of cases^ and
21	symptom based definition^ of preceding illness. Preceding illness occurred in
22	The precise^ aetiology of this preceding illness is unclear and may be a^
23	illness and preterm birth. A^ preceding illness has previously been identified as
24	illness (in cases) and preceding illness^ (in cases and controls?for
25	illness:^ symptoms of prodromal illness (in cases) and preceding illness^
26	because of preceding or prodromal^ illness. Religious observance has been
27	bias arises from preceding or prodromal illness, as a reduction^ in risk behaviours
28	or lactating, or had a psychotic illness^ or an illness with a prognosis of
29	for important aspects of a patient?s illness^ such as delirium and cognitive
30	speaking,^ altered mental state, severe illness, urgent need for cannulation),^
31	indicated that^ behaviour change due to illness was not a significant source^ of
32	sustaining health rather^ than treating illness."^13 ^ We included trials reporting
33	creatinine >221 mmol/l; unstable illness;^ active ischaemia *Agents

Appendix 2 (a)

The following is a selection of text pieces - in the corpus from the BMJ online (95,288 words) - where *disease* is associated with specific pathological conditions.

Names of pathological conditions and occurrences of *disease* have been highlighted in bold type.

1. Unsurprisingly, the striking feature is the numbers of infectious and parasitic **diseases**, which accounted for nearly a fifth of deaths. Many of these were in the young, with over 90% of deaths from diarrhoea and **dysentery**, **measles**, and **whooping cough** being among those aged under 5.
(BMJ 2009;339:b3454, doi: 10.1136/bmj.b3454)

2. Self reports of major chronic **diseases** (such as **cancer**, **diabetes**, **coronary heart disease**, **stroke**, **Parkinson's disease**, and **multiple sclerosis**) were confirmed through various methods, including review of medical records and pathology reports, telephone interview, and supplementary questionnaires to participants.
(BMJ 2006;332:875-884 (15 April), doi:10.1136/bmj.38771.583796.7C)

3. Our exclusion criteria were a history of major chronic **diseases** at study baseline in 1976, including **cancer**, **diabetes**, **myocardial infarction**, coronary artery bypass graft surgery, **stroke**, **kidney failure**, **chronic obstructive pulmonary disease**, **Parkinson's disease.**
(BMJ 2009;339:b3796, doi: 10.1136/bmj.b3796)

4. If **pneumonia** was suspected the participant was assessed at the affiliated hospital; the medical staff at the nursing homes also informed the study coordinator of the occurrence of **pneumonia** or any other **disease**.
(BMJ 2010;340:c1004, doi: 10.1136/bmj.c1004)

5. Interpreting the relevance of associations between low body mass index and chronic **disease** such as **cirrhosis** is difficult, as analyses may not adequately compensate for the likelihood that early liver disease may affect body mass index before the first hospital admission or death occurs -for example, by reducing appetite or by causing malabsorption.
(BMJ 2010;340:c912, doi: 10.1136/bmj.c912)

6. The challenge of treating patients with both active **psoriasis** and active **psoriatic arthritis** is to optimise the treatment of both **disease** manifestations to give the best overall outcome.
(BMJ 2010;340:c147, doi: 10.1136/bmj.c147)

7. The cutaneous symptoms of **psoriatic arthritis** usually appear a decade or more before the joint symptoms, enthesitis, and dactylitis. The **disease** affects men and women equally and has a worldwide distribution.
(BMJ 2009;339:b2433, doi: 10.1136/bmj.b2433)

8. 20. Box 1: **Diseases** included in **disease** count

* **Hypertension**
* **Ischaemic heart disease**
* **Cerebrovascular disease**
* **Peripheral vascular disease**
* **Heart failure**
* **Atrial flutter** or **fibrillation**
* **Arthritis** (**osteoarthritis** or **cervical** or **lumbar spondylosis** or **rheumatoid arthritis** or other **arthritis** or **non-specified arthritis**)
* **Osteoporosis**
* **Chronic obstructive pulmonary disease or asthma**
* **Diabetes**
* **Hypothyroidism** or **hyperthyroidism**
* **Cancer** diagnosed within past five years (excluding non-melanoma skin cancer)
* Eye **disease** (**cataract** or age related **macular degeneration** or **glaucoma** or **diabetic eye disease** or registered blind or partially sighted)
* **Dementia**
* **Parkinson's disease**
* **Renal impairment**

(BMJ Apr 2008; 336: 754 - 757; doi:10.1136/bmj.39489.590671.25)

Appendix 2 (b)

The following is a selection of text pieces - in the corpus from the BMJ (95,288 words) - where *illness* occurs. In all extracts selected *illness* does not refer to any specific pathological condition, except in extracts 6 and 7.

Names of pathological conditions and occurrences of *illness* have been highlighted in bold type.

1. Compared with the reference group (women with a body mass index of 22.5 to <25), both the women who had a lower body mass index and those with a higher body mass index had a significantly greater relative risk of cirrhosis. Among women with body mass index below 22.5, we cannot exclude the possibility that previous **illness** may have contributed to weight loss, and for this reason we focused our analyses on women with a body mass index of 22.5 or above. Among women who had a body mass index of 22.5 or above, little evidence existed to suggest non-linearity in the relation between body mass index and the relative risk of cirrhosis related hospital admission or death (test for non-linearity, P=0.2).
(BMJ 2010;340:c912, doi: 10.1136/bmj.c912)

2. We invited mothers who gave birth at the maternity wards of the national hospital and a local health centre (Bandim Health Centre) to participate in the study when their child was to receive BCG vaccination after delivery. Furthermore, we invited mothers who delivered at home to participate when they came for BCG vaccination at two of the three health centres in the study area (Bandim and Belem). We did not include the third health centre (Cuntum) for logistical reasons. The inclusion criteria were weight at least 2500 g at presentation and no signs of overt **illness** or malformations. Infants who died in the maternity wards, before the vaccination team arrived in the morning, could not be assessed for enrolment. This was also the case for those born at home who died before their mother brought them for vaccination.
(BMJ Jun 2008; 336: 1416 - 1420; doi:10.1136/bmj.39542.509444.AE)

3. To examine the relation between hospital orthopaedic specialisation and postoperative surgical outcomes we carried out a retrospective cohort study of US Medicare beneficiaries (all Americans aged 65 and older) who underwent total hip replacement or total knee replacement. We developed a measure of a hospital's orthopaedic specialisation and then compared the demographics, socioeconomic status, and prevalence of comorbid **illness** among patients who received total hip replacement or total knee replacement in hospitals with lower and higher degrees of orthopaedic specialisation. We then assessed the structural characteristics of less and more specialised hospitals.
(BMJ 2010;340:c165, doi: 10.1136/bmj.c165)

4. In contrast, the effects of illness or drug use on sexual function in women are poorly understood. Sexual problems, including low desire, vaginal dryness, difficulties with orgasm, and pain with intercourse are prevalent among sexually active older women,1 are associated with decreased sexual satisfaction, but typically do not render a woman physically incapable of sexual intercourse. Women's sexual interest or motivation may be more resilient to **illness** or sexual problems than men's, may be more contextually dependent on the partner or situational factors, or, as seen in younger populations, older women may have less agency over their sexual activity than men.
(BMJ 2010;340:c810, doi: 10.1136/bmj.c810)

5. To examine the relation between hospital orthopaedic specialisation and postoperative surgical outcomes we carried out a retrospective cohort study of US Medicare beneficiaries (all Americans aged 65 and older) who underwent total hip replacement or total knee replacement. We developed a measure of a hospital's orthopaedic specialisation and then compared the demographics, socioeconomic status, and prevalence of comorbid **illness** among patients who received total hip replacement or total knee replacement in hospitals with lower and higher degrees of orthopaedic specialisation.
(BMJ 2010;340:c165, doi: 10.1136/bmj.c165)

6. Pregnant women are at increased risk of influenza and its complications. The effects of influenza during pregnancy have been noted in previous pandemics, particularly the increased mortality in pregnant women compared with the general population. The 2009 influenza A/H1N1 pandemic was the first influenza pandemic to occur in the era of modern obstetric and intensive care management, and pregnancy is a risk factor for critical **illness** due to 2009 **H1N1 influenza**.
(…)
Of 59 women with available data, 25 (39%) had a body mass index of more than 30 and 13 (20%) an index or more than 35. Overall, 36 women (56%) had a documented coexisting **illness**, of whom 21 (33% of total) had **asthma**.
(BMJ 2010;340:c1279, doi: 10.1136/bmj.c1279)

7. The 3818 study hospitals carried out 1 273 081 major joint replacements from 2001-5. Patient characteristics and comorbidity varied as hospital specialisation increased (table 1Go). In particular, more specialised hospitals treated a lower proportion of women and African-Americans (P<0.001 for each) and those with fewer comorbid **illnesses**, including **diabetes** and **heart failure.**
(…)
Myalgic encephalitis, is characterised by disabling physical and mental fatigue, lasting for at least six months, without an apparent physical cause. The hallmark of the **illness** is debilitating fatigue, but symptoms like myalgia, disrupted sleep, difficulty with concentration, sore throat, and lymphadenopathy may also be present, albeit more variably. More than two thirds of patients are women. Although the cause is unknown and the **illness** may cover more than one entity, many have suggested that infectious agents have a role.
(BMJ 2010;340:c165, doi: 10.1136/bmj.c165)