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A Less than Lay-Friendly Translation: A Textual Analysis of Information Leaflets and Labels for Drug and Cosmeceuticals in Thailand

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Abstract

Information on drug use should be easily comprehensible and provide clear instructions without relying on expert advice. Drawing upon the concept of lay-friendly translation (Askehave and Zethsen 2002, 2014; Jensen 2013), this study examines the translated information leaflets and labels of drug-related and cosmeceutical products in Thailand to understand characteristics of supposedly reachable language use. The findings reveal both lay-friendly and non-lay-friendly features in the English-to-Thai translations. Indicative of the former is the use of general terms, explanation, glossing, rewriting/summarising, syntactical shift, and stylistic shift. Instances of the latter include the direct transfer of field-specific terms and the use of Thai medical vocabulary. The Thai-to-English translation tends to adhere to the original version, including textual organisation and compliance with Thai legislation, yet the cultural-specific items are omitted. The presence of both lay-friendly and non-lay-friendly elements in a single translation contributes to a 'less than lay-friendly' translation.

Keywords

drug information leaflet – drug label – cosmeceuticals – lay-friendly – translation

1   Introduction

Patients, their family members, or the general public with different levels of literacy skills and communication quality (McCray 2005; Champlin et al. 2017) may need to read a variety of medical texts to obtain information crucial to their health, such as consent forms, clinical reports, health campaigns, drug labels, patient information leaflets (PILs), and drug information leaflets (DILs). Each of these documents has a different level of importance and is the means by which senders (e.g., pharmacists and drug producers) instruct recipients (e.g., patients and consumers) on how to safely use the drug and avoid therapeutic mistakes (Montalt Resurrectió and González Davies 2006). Numerous translation studies and health promotion researchers (e.g., Askehave and Zethsen 2002; Gal and Prigat 2005; Maat and Lentz 2010) concur that drug labels can often be challenging to understand, leading to confusion among patients or general medical users and an inability to meet their target users' communication demands. It is often the case, arguably, that inappropriate use of language contributes to patients' difficulties with readability.

Askehave and Zethsen (2003) believe that the intended audience for drug information leaflets can be an entire country's population. The sender-receiver relationship is asymmetrical (an anonymous expert sending a message to a layperson), and there is often no contact between the parties. The existence of this genre is dictated by the laws and the relevant regulations made by each country's authorities. The communication is strictly functional, instructing the audience to do something they would never otherwise do. Furthermore, Montalt Resurrectió and González Davies (2006) describe the characteristics of these medical texts as instructive (on the part of the sender) and as a continuation of care following treatment (for receivers). The senders are pharmaceutical companies that adhere to the standards of a country's regulatory agencies. Therefore, to have a reassuring effect, complex materials of this type should be summarised in simple terms, directed first at experts in the same field, and then communicated to non-experts (Vinker et al. 2007).

When it comes to translation, the unique qualities of medical texts become all the more noticeable and challenging to convey accurately. According to Askehave and Zethsen (2000, 2002), translating pharmacological information involves two factors. The first is the *intergeneric* translation or the extraction

and transfer of expert-written drug information to the medicine label and information leaflet. It can be regarded as intralingual translation (expert-to-lay translation), in which professional translators are frequently overlooked by decision-makers (Zethsen 2018). In this sense, translation refers to the transition between subgenres of medical texts or the translation from one genre to another. The second factor is the *interlinguistic* translation, or the proper translation, of drug details from the language in which the product was originally developed into another language. Similarly, Montalt Resurrectió and González Davies (2006) assert that genre shifts and interlinguistic variances are two main challenges in transferring drug information. Translation commissions can allow genre shifts; the translated text may differ from the source culture's original genre. Interlinguistic variance refers to situations in which, despite belonging to the same genre as the original text, the target text may differ in how it is realised in the target culture. At the textual level, when medical information is transmitted to end-users, it is most susceptible to format changes as a result of rendering the medical terminology. There have been some recognitions of its linguistic features (e.g., lexical bundles), names of diseases, acronyms, pharmaceutical register, and nature of noun compounds in medical terminology, where many studies have attempted, for pedagogical reasons, to find for it a translation strategy (e.g., Zethsen 2004; Jensen 2013; Karwacka 2015; Grabowski 2015; Kronvall 2017).

All of the above studies agree that various characteristics of medical texts in translation, whether from one language to another or from one genre to another, can influence the translator's choices and purposes in 're-presenting' medical discourses (e.g., product summary information, package label, and leaflet). Hence, the translator may face significant challenges in achieving layperson accessibility when working with such characteristics, not to mention other factors such as the socioeconomic, cultural, and educational, as well as the power relationship between medical communicators (Liu et al. 2014; Kamran et al. 2022). The present study uses this pivotal role of translation for medical text as a point of departure to examine how drug information leaflets and labels are translated in the Thai context and to interpret what implications can be drawn for the wider society regarding understandable translation and its consequences for the country's public health. The key objective of this paper is to analyse the characteristics of DIL and drug label translation and provide plausible explanations of the processes involved in developing and translating drug foods and cosmeceuticals before they are released on the market.

2   Lay-Friendly Translations of Medical Text

With health literacy at the forefront, studies on health communication have emphasised the accessibility and comprehension of medical information. Communication can impact patient medication in two ways: expert-to-layperson information for new target users in a different cultural environment (Nisbeth Brøgger and Zethsen 2021) and attitudes and expectations of professional translators (Valdez and Vandepitte 2020). This is because many health communication documents are initially written in English before being rendered into other languages. The senders' specialised vocabulary in the original can remain dominant and hence fail to be translated across genres and languages (see Zimmermann and Jucks 2018; Zethsen 2018).

Since Newmark (1979) proposed a method for translating medical texts for laypeople, there has been a number of studies on the patient-centred translation of medical texts. Askehave and Zethsen (2002, 2003, 2008, 2014) have pioneered such research on materials for package labelling and posited the concept of lay-friendly or user-friendly translation. Other studies have similarly suggested that translations of package leaflets and drug labels should be user-friendly (e.g., Ezpeleta Piorno 2012; Karwacka 2014, Montalt et al. 2018). However, because many experts in the field of medicine (but without training in translation skills) often have a chance to translate labels that contain medical terminologies, some of their jargons remain visible in the final translated product. Experts often find it difficult to translate those medical expressions into layman's terms, causing readability issues for general patients who must rely on such information. Even when such texts are handled by experienced translators in the medical field, professional medical jargon is frequently employed (see also Jensen and Zethsen 2012; Jensen 2013). According to Montalt et al. (2018), once translators are trained in medical translation, they are prone to becoming semi-experts in the field of medicine and oblivious to what the average person would find hard to comprehend.

Furthermore, some problems can be detected at the contextual level. As Gal and Prigat (2005) opine, drug label and leaflet developers may face organisational politics and various pressures during certain processes, including intended users, conflict interests, organisational workflow, readability considerations, and evaluation practices. These characteristics may have an impact on content creation, resulting in decreased comprehensibility and usability of the leaflets.

To deal with the above problems, at least on the textual level, many translation studies scholars have advocated for the concept of lay-friendliness

in the translation of medical information to benefit the lay audience in the target cultures (Askehave and Zethsen 2002, 2014; Jensen 2013). This concept relates primarily to the use of plain language and intralingual translation, or the translation of a complex monolingual text into more straightforward language for laypeople to read and follow. The use of plain language encourages avoidance of specific linguistic features such as nominalisation and medical register (Jensen 2013, 116). To obtain a desirable lay-friendly translation of medical texts, Askehave and Zethsen (2002, 20-24) and Jensen (2013, 117) highlight some vital features to which translators (whether experts or non-experts in the medical field) should pay attention, namely, syntactical organisation, Latin-based terms, voice, compounds, pronouns, lexical cohesion, polysemic words, stylistics, and inconsistency in terminology use. Looking from the perspective of translation procedures, Jensen and Zethsen (2012, 40-41) advise that translating with plain language, glossing, and explanation can all contribute to lay-friendliness in the target text, while non-glossing, non-explanation, calque, and preferring expert terms over common ones all contribute to non-lay friendliness.

The present paper analyses information leaflets on drug labels and cosmeceutical items sold in Thailand using the conceptual framework mentioned above. The researchers assume that Thai translations of these medical texts may have linguistic features that may or may not contribute to the concept of lay-friendliness, and they may differ from the findings of previous Western-oriented studies.

This study is important because there has been little research into the textual analysis of language use in drug and cosmeceutical products sold in Thailand. We have found, thus far, a large body of work focusing merely on medical information and its relevance at the contextual level. These quantitative studies were conducted by pharmaceutical and medical researchers to show participants' positive attitudes toward, for example, the efficiency of patient information leaflets for both pharmacists and their patients (Phueanpinit et al. 2014), good behaviour in reading package inserts (Pongpunna et al. 2019), standard distribution of patient information pamphlets (Jarernsiripornkul et al. 2020), and development of electronic medical information (Wongtaweepkij 2020). The body of knowledge in Thailand concerning the textual analysis of the language use in medical texts is clearly underdeveloped. Therefore, it is necessary to return to the fundamental study of texts intended for laypeople to identify the inherent characteristics of drug information leaflets and labels upon which Thai patients and the general public can rely.

3   Research Design

This paper used a qualitative approach to compare the original drug information leaflets and labels with their translations. For this purpose, the researchers gathered 40 DILs and labels containing medical information in both English and Thai without restrictions on length, size, or manner of distribution. Those on cosmeceuticals and dietary supplements were also included in the collection. The samples were culled from many sites readily accessible to drug users, including healthcare facilities, pharmacies, and convenience stores. The sampling period was between 1 May 2020 and 30 November 2020. Although the collection was formed around the time of the COVID-19 outbreak in Thailand, it was not affected by the quarantine or the government's restrictive measures because it is a text-based data collection.

DILs and labels were chosen as our case study because, while it is well acknowledged that the vast majority of such documents in Thailand are difficult to understand (e.g., Pongpunna et al. 2019; Burapadaja et al. 2004), there appears to be no study that explains what exactly is so difficult about them. Another reason is that the researchers see the potential harm to the wider population's health due to drug misinformation and, hence, misuse stemming from information illegibility (e.g., Maat and Lentz 2010; Zethsen 2018; Zimmermann and Jucks 2018) if the characteristics of textual nuances between the original and translation remain unexplored.

This study, therefore, identifies the general characteristics of DIL and label translation by means of qualitative discussions with selected examples. The collected dataset was divided into two groups: English-to-Thai translation (representing imported medical products) and Thai-to-English translation (indicative of drugs manufactured in Thailand). This classification lends itself to comparison of the similarities and differences in textual features between the two groups. As guided by the conceptual framework of lay-friendliness in translation (Askehave and Zethsen 2002, 2014; Jensen 2013) outlined in the preceding section, we analysed the data regarding their textual dimensions of words, sentences, information arrangement, and style that emerge as potential unique characteristics in our present case. We followed the analysing procedure devised by Jensen and Zethsen (2012), starting with reading the text for the overall meanings of each DIL and label, then comparing each segment of the translated DIL and label with that of their original. Next, we identified and coded each lay-friendly element and non-lay-friendly element according to their textual dimensions. After that, all codes were verified for consistency. Finally, the viability and credibility of the results were ensured by multiple reviews of the dataset and by turn-taking among the researchers to examine it

for similarities and differences in structure and language use between the two languages and two groups.

In presenting the findings, the drug and company names are anonymised. Results from the textual analysis are then discussed in light of their possible implications for relevant authorities for standardisation and the medical translation practice in Thailand in order to shed light on the Thai context of drug information translation.

4 Results: Shift in Translation of DIL s and Labels

In this section, we focus on features that are likely to influence the reader's comprehension (e.g., mistranslation, syntactical confusion, or stylistic change), as advised by Askehave and Zethsen (2002) and Jensen (2013). The present study acknowledges that these features may inadvertently result in a certain level of unfriendly use for laypeople. In line with Askehave and Zethsen's (2002) argument, the researchers found that domain-specific phrasing and direct transfer appear to have a negative impact on how one would receive the text. More notable are the high degree of formality, style errors, and incoherent terminology. Although complex syntactic structures, formal phrases, and field-specific vocabulary are not always considered mistranslations, they do impede the successful transmission of medical information to readers. The subsequent sub-sections begin with translations from English to Thai, followed by those from Thai to English.

4.1 *English-to-Thai Translation*

For the purposes of this study, this sub-section presents the findings based on the linguistic features uncovered after comparing English source texts (ST s) and Thai target texts (TT s). They include (1) field-specific terms and (2) features at the above-word level.

4.1.1 Field-specific Terms

Since a DIL is primarily intended for laypeople, only elements that the lay receiver can understand should be used. Grecian-Latinate terms are among the most problematic for laypeople to understand, particularly because consumers may misinterpret terms that medical experts deem to be typical. There is a disparity between what professionals consider standard vocabulary and what ordinary people use (Jensen and Zethsen 2012). The likely impact of translating field-specific terms elicited from the current textual comparison

can be divided into two categories: (1) lay-friendly and (2) non-lay-friendly translation.

Firstly, the lay-friendly translations we found in this study include the use of general terms, concise information, and explanations of complicated medical concepts. Note that the examples of the source text (ST) and target text (TT) below will be followed by the researchers' back translation (BT), which may not be grammatically correct in some instances, but is meant merely to demonstrate the flow of thought and how the translator rearranges the clauses.

a) Using general terms: The Thai version of the text contains general terms or phrases that patients can easily understand, as shown in Table 1.

The last two examples, taken from the subheading of the DILs, are noteworthy because the source text provides general English terms that take on a specific meaning or connotation when used in the medical setting and situation. The Thai translation helps clarify them for the new target reader: *Local* translated as *aakaan chàphɔ́thîi* 'location-specific symptom' and *Systemic* as *aakaan thûapay* 'general symptom'. In the dataset studied, these terms are typically found in DILs for unguent or liniment.

b) Explanation: The translator gives the reader more information by using as simple terms as possible.

TABLE 1   Examples of lay-term used in Thai translation of English DILs and labels

ST	TT	BT
Ocular hyperaemia	taadɛɛŋ	red eye
Pregnancy	satrii tâŋkhan	pregnant women
Lactation	satrii ráwàaŋ hâynom bùt	women during breastfeeding
Dermatologically tested	phàankaanthótsɔ̀ɔp càak phûuchîawchaan dâan phǐwphan	approved the test by skin experts
Local	aakaan chàphɔ́thîi	area-specific symptom
Systemic	aakaan thûapay	general symptom

(1)

(a) ST: Use with **Systemic Immunosuppressive Medications**

TT: kaan hâyyaa rûamkàp **yaakòtphuumtâanthaan thîi hây khâw kràsĕɛ loohìt thûa râaŋkaay**

BT: [Use with an immunosuppressive drug given to bloodstream of the whole body]

(b) ST: Allergic **cutaneous** manifestations (i.e. itching and erythema) may arise **in very rare cases.**

TT: àat phóp aakaan phéɛ thîi **phĭwnăŋ** dâay tèɛ **nɔ́ɔy mâak** chên aakaan khan kɔ̀ət phừun dɛɛŋ (**thêɛp mây phóp**)

BT: [[You] may find skin allergy, but very little, such as itching and rash (hardlyfound)]

The nominal phrase *Systemic Immunosuppressive Medications* in (1a) is rendered with a lay-friendly string of words: *yaakòtphuumtâanthaan thîi hây khâw kràsĕɛ loohìt thûa râaŋkaay* 'immunosuppressive drug given to bloodstream of the whole body'. Whereas (1b) is a mixture of using the lay-friendly term (*phĭwnăŋ* 'skin' for *cutaneous*) and accentuating some information in parentheses to foreground the explanation for the reader's benefit (*nɔ́ɔy mâak … thêɛp mây phóp* 'very few … hardly found' for *in very rare cases*).

c) Glossing: Similar to the above translation procedure, the translator puts the English field-specific term in parentheses after a lay-friendly explanation.

(2)

ST: Therapeutic indications […] Vertebral pain syndromes (intervertebral disk, nuchal pain, lumbago …)

TT: khɔ̂ɔ bòŋ cháy nay kaan ráksăa […] klùm aakaan pùat àksèep bɔɔríween nɛɛw khăysănlăŋ (Vertebral pain syndromes) chên thîi mɔ̆ɔn rɔɔŋ kràdùuk (intervertebral disk) aakaan pùat khlét thîi bɔɔríween dâanlăŋ khɔɔ (nuchal pain) bɔɔríween sàphôok (lumbago) …

BT: [Healing indications […] syndromes that cause pain along spinal cords (Vertebral pain syndromes), for example, around the intervertebral disc (intervertebral disk), sprain around the back neck (nuchal pain), [pain] around hip (lumbago) …]

One possible explanation for putting all English medical jargon in parentheses in (2) is that the translator attempts to clarify to which medical

concept those lay-friendly explanations correspond. Some terms are too broad (*sàphôok* 'hip'), and they are needed to be narrowed down in case medical professionals use the drug.

Secondly, non-lay-friendly translations found in this study include those in which the translator applied borrowed words–without further explanation– and Thai medical jargon, as demonstrated by the following three translations.

a) Transliteration: The translator directly transliterates the Grecian-Latinate terms into Thai, as shown in Table 2.

TABLE 2   Examples of transliteration in Thai translation of English DILs and labels

ST	TT	BT
Individuals with **phenylketonuria**	phûu thîi mii phaawá **fiininkiitoonuuria**	Those who have **phenylketonuria**
aescin inhibits exudation by reducing extravasation of fluid into the tissue space	**èetsin** miiphŏn yápyáŋ kaanphàan khɔ̌ɔŋ sǎan càak lɔ̀ɔt lɯ̂at khâwsùu chɔ̂ŋwâaŋ khɔ̌ɔŋ núayɯ̂a	**aescin** can hold back the flow of fluid from blood vessels to the tissue space
Thiamine and/or **pyridoxine**	**thay a miin** lɛ́/ rɯ̌ɯ **phayridɔ̀ɔksin**	**Thiamine** and/or **pyridoxine**

Interestingly, the last example, taken from the food interaction section of the leaflet for an effervescent tablet, is considered double non-lay-friendly because of its transliteration of *Thiamine* and *pyridoxine* where more lay-friendly terms like 'vitamin B1' and 'vitamin B6' exist.

b) Calque: The translator directly quotes all Romanised medical terminologies into Thai without any gloss or explanation.

(3)

(a) ST: A number of conditions other than pregnancy, including **tropho-blastic** disease and certain non-**trophoblastic** neoplasms [...]

      TT: ŋûankhǎy ɯ̀ɯn ɯ̀ɯn nɔ̂ɔkcàak kaan tâŋkhan ruamtháŋ rôok **Trophoblastic** lɛ́ núaŋɔ̀ɔk thîi mâydâay kə̀ət càak **trophoblastic**

      BT: [Other conditions, apart from pregnancy, including Trophoblastic disease and neoplasms that are not caused by trophoblastic]

(b)   ST: There are no adequate and **well-controlled** studies ...

       TT: nûaŋcàak mâymiikaansùksǎa bὲεp **well-controlled** ...

       BT: [Since there are no well-controlled studies ...]

Both (3a) and (3b) illustrate the translator's futile attempt to make field-specific terms understandable in Thai. The first is the case of medical jargon, whereas the second is simply a general term with a specific meaning when applied to a medical setting. However, although those who speak English will find *well-controlled* to be reasonably lay-friendly, those who do not use English for day-to-day conversation may find it to be a hindrance.

c) Thai medical jargon: The translator carefully adheres to the standard Thai medical terminology, which are generally established by the Royal Institute of Thailand. Using Pali-Sanskrit terms that already exist in Thai, this collection of terminology was built to correlate to the original English meaning (Sukpanichnant 2008).

The terms *pheesàt phonlasàat* and *pheesàt conlanasàat* in Table 3 are commonly used within clinical trials. In this instance, they are part of the details the manufacturer may intend to include in the DIL. A translator may use them for conciseness; otherwise, they may need to unbundle their meanings to convey them in plain language (cf. Jensen 2013, 116). However, the resulting phrase would be somewhat lengthy, and the reader may not comprehend it regardless. All of the terminologies in Table 3 are commonly found in Thai medical textbooks, which laypeople are unlikely to have access to. Typically, these terminologies are not widely available in the public domain; therefore, they should arguably be 're-translated' into basic Thai so that laypeople with low levels of education may have at least a basic understanding.

4.1.2   Features at the Above-Word Level

While field-specific terms, as mentioned in the preceding section, may be unfamiliar to the customer and pose an immediate barrier to understanding, most grammatical elements of the inserts are familiar to the consumer. Nevertheless, the reader of medical texts may find the texts less accessible if certain complex structures are frequently used since they make the writings more condensed and difficult to understand (Askehave and Zethsen 2000). Our findings show that the features at the above-word level within the data under investigation include the shift of syntactical structure (e.g., nominalisation and passivisation), rewriting/summarising, stylistic shift, and reformatting.

a) Syntactical structure shift: Nominalisation, passivisation, and agency concealment appear to be the preferred translation procedures.

TABLE 3   Examples of Thai medical jargon used in translation

ST	TT
Pharmacodynamics	pheesàt phonlasàat
Pharmacokinetics	pheesàt conlanasàat
Interactions	antrakìríyaa
	patìkìríyaa tɔ̀ɔpsanɔ̌ɔŋ

Nominalisations in particular frequently cause problems at the clause level because they make a document impersonal by compressing and abstracting the ideational viewpoint. This may make it unclear to the drug user who should perform an action such as taking medicine (cf. Jensen 2015). Using an active verb form instead of nominalisation is believed to improve the readability of a document (Jensen and Zethsen, 2012), as shown in (4) below.

(4)

(a)   ST: In this situation steroids **should be reduced** or **discontinued** gradually

      TT: naykɔɔraniiníi **khuan khɔ̂y khɔ̂y lót** rɯ̌ɯ yùt **kaan cháy** yaa sati-arɔɔy chanít thaa

      BT: [In this case, [you] should gradually reduce or stop the use of topicalsteroids]

(b)   ST: **Safety** and **effectiveness have not been demonstrated** with [name drop] in paediatric patients.

      TT: **yaŋ mâymii khɔ̂ɔmuun** dâan **khwaamplɔ̀ɔtphay lɛ́ pràsìt-thíphâap** khɔ̌ɔŋ kaan cháy yaa nay phûupùay dèk

      BT: [There is no information about the safety and effectiveness of drug use in child patients]

   In (4a), the passive clause *steroids should be reduced or discontinued* is changed to the active clause: *khuan khɔ̂y khɔ̂y lót rɯ̌ɯ yùt kaan cháy* '[you] should gradually reduce or stop the use of topical steroid'. However, this is also the case of agency concealment, to some extent, because the subject of the clause can be dropped if it can be anaphorically referred to (in this case, 'you' or 'the potential user'). Moreover, (4b) contains yet another change of passive structure from *Safety and effectiveness have not been demonstrated*

to *yaŋ mâymii khɔ̂ɔmuun dâan khwaamplɔ̀ɔtphay lé pràsìtthíphâap* 'There is no information about safety and effectiveness'. This also conceals the actual agency of the clause in terms of who does not have such information.

b) Rewriting/summarising: This translation procedure becomes necessary when there is a detailed description of medicine administration or indication of use.

(5)

ST: Local irritation: If local irritation develops, **discontinue** use and institute appropriate therapy.

        Atrophic change: Certain areas of the body, such as **the face, groin and axillae**, are more prone to atrophic changes than other areas of the body following treatment with **corticosteroids.**

TT: hàak kɜ̀ɜt kaanrákhaaykhɯaŋ **khuan yùt** yaa lɛ́ɛw ráksǎa dûay wíthii ɯ̀ɯn thîi mɔ̀sǒm **khuan lìiklîaŋ** kaan cháy yaathaa bɔɔríween **baynâa lé bɔɔríween sɔ̂ɔk pháp khɔ̌ɔŋ phǐwnǎŋ** nɯ̀aŋcàak kɜ̀ɜt Atrophic changes chên phǐwnǎŋ baaŋ tɛ̀ɛklaayfɔɔ dâay

BT: [If there occur irritation, [you] should stop using drug and treat [yourself] with other appropriate methods, should avoid using balm around face and area under folded skin due to Atrophic changes [*sic*] such as stretch marks and withering skin]

The case of (5) shows the combination of rewriting and summarising. First, the translator inserts modality of obligation into English imperative sentence *khuan yùt yaa lɛ́ɛw* '[you] **should** stop using drug' for *discontinue use*, and the addition of *khuan lìiklîaŋ* '[you] should avoid'. Second, the terms *groin* and *axillae* were replaced with a less specific term *bɔɔríween sɔ̂ɔk pháp khɔ̌ɔŋ phǐwnǎŋ* 'area under folded skin'. This is a case of euphemism in which the inappropriate indication of the private part is minimised in the official presentation. Lastly, the whole clause *Certain areas of the body [...] are more prone to atrophic changes than other areas of the body* is summarised into *nɯ̀aŋcàak kɜ̀ɜt Atrophic changes chên phǐwnǎŋ baaŋ tɛ̀ɛklaayfɔɔ dâay*, wherein the translator directly relays *atrophic changes* with an example (*chên phǐwnǎŋ baaŋ tɛ̀ɛklaayfɔɔ* 'such as stretch marks and withering skin') and deletes the medical jargon *corticosteroids*. This example shows how a DIL might have both lay-friendly and non-lay-friendly features, leading to an awkward reading of the medical text.

c) Stylistic shift: Due to the influence of the target text, various elements of the English original are adjusted to match the new purpose of the text and cultural expectations.

(6)

(a)   ST: Adults – Take 1-2 tablets daily with a meal, or as **professionally** prescribed.

     TT: phûuyày – ráppràthaan wan lá 1-2 mét phrɔ́ɔm aahǎan rǔu taam khamnénam khɔ̌ɔŋ **phɛ̂ɛt rǔu pheesàtchakɔɔn**

     BT: [Adults – Take 1-2 tablets a day with a meal, or according to therecommendation by a physician or pharmacist]

(b)   ST: Then rinse off and shampoo as usual

     TT: **lûaksǎn wíthii thîi mɔ̀kàp tua khun** lɛ́ **khuun khwaamchûm-chûun hây sên phǒm**

     BT: [Choose the suitable method for you and return moisture to [your] hair]

Example (6a) presents a case of agent explicitation. The term *professionally* is made clear in the Thai version with phɛ̂ɛt rǔu pheesàtchakɔɔn 'physician or pharmacist'. The writing style in (6b) is shifted from informative to persuasive by the addition of more eloquent phrases. One explanation for this is that the product's purpose is changed in the target culture to attract more customer attention. This style is commonly found in cosmeceuticals, which can be purchased at a convenience store or from a pharmacist.

d) Reformatting: The format of English DIL s and labels tends to be changed for compatibility with Thai language expectations. According to the data, there are four types of shift in format of the ST to adhere to Thai norms: font size modification, text emphasis (bold lettering instead of capitalisation), deletion of unnecessary information, and re-arrangement of information. Due to the limited space, only an instance of deletion of unnecessary information and re-arrangement of information are provided below.

(7)

ST: [Name drop] **is very well tolerated by users though there have been some reports of** burning or stinging, allergic reactions, and red eyes after instillation. If you notice any of these, discontinue use and consult a physician.

TT: lăŋ yòt yaa àatmii aakaan sèɛptaa phɛ́ɛ rǔɯ taadɛɛŋ hàak mii aakaan daŋklàaw hây yùt cháy yaa lɛ́ prɯ̀ksǎa phɛ̂ɛt

BT: [after dropping the drug, [it] may cause stinging eyes, allergy or red eyes. If [you] have such symptoms, stop using the drug and consult a physician]

The above example illustrates how some ST information is omitted and rearranged to make the TT succinct, leading to the loss of some information deemed irrelevant by the translator. This is a borderline case of summarising, in which the sentences have been condensed into one, but all meanings have more or less been well maintained. The current procedure prioritises a text's conciseness over its holistic meaning.

4.2   *Thai-to-English Translation*

For this category, the researchers focus on drugs and cosmeceuticals produced locally, with source medical information in Thai. The findings here were markedly different from those in the previous section. The pattern of the Thai original is likely to be followed in the Thai-to-English translation of DILs and labels. This case results in a simple, loose pattern of the translated text and contributes to an easy-to-read English translation but not necessarily an easy-to-understand one. We look at three apparent aspects of the texts under concern: textual organisation, adherence to Thai societal norms, and presence of culture-specific items.

a) Textual organisation: The translator tends to conform to the Thai ST structure and sentence length. The translation procedures tend to be literal while retaining the word strand. As a result of the influence of Thai ST on the English TT, certain confusing information in the Thai ST is still noticeable in the example below. Note that the researchers' literal translation (LT) will follow the source text in the examples below.

(8)

ST:	sàpphakhun	thamkhwaamsààat bàatphlɛ̌ɛ
	wíthiicháy	cháy thamkhwaamsààat bàatphlɛ̌ɛ
LT:	[Medical property:	Cleaning the wound]
	[Application:	Using [it] to clean the wound]
TT:	Indication:	Wound cleaning
	Application:	Clean the wounds

This excerpt in (8) does not make a clear distinction between medical property and indication. The descriptions for each are, in fact, identical. This implies that the English TT is heavily influenced by the Thai ST, which leaves the translator with no alternative but to rely on the already limited data. Next is the case of retaining the writing pattern, as shown in Table 4.

TABLE 4　　The textual organisation of an Thai ST and English TT, as appeared in the actual label

[Product name] (phalìttaphan sə̌əm aahǎan ɛɛw-kluutaathay-oon, sǎan sakàt càak sǎaràay khlɔɔrewlaa lɛ́ sǎan sakàt càak khamîn chan)		[Product name] (L-Glutathione, Chlorella Extract and Curcumin Extract Dietary Supplement Product)	
sùanpràkɔ̀ɔp thîi sǎmkhan	Percentage (%)	MAIN INGREDIENTS	Percentage (%)
ɛɛw-kluutaathay-oon	50.000	L-Glutathione	50.000
sǎan sakàt càak sǎaràay khlɔɔrewlaa	20.000	Chlorella Extract	20.000
sǎan sakàt càak khamîn chan	6.600	Curcumin Extract	6.600
wíthii ráppràthaan: ráppràthaan wan lá 1 khɛ́psuun kɔ̀ɔnaahǎan		Usage: Take 1 Capsule before meals	
wíthii kèpráksǎa: khuan kèp wáy nay thîi hɛ̂ŋ lɛ́ yen hàaŋ càak sɛ̌ɛŋdèɛt		Storage: Keep in a cool & dry place, away from strong direct sunlight	

Table 4 illustrates how identical textual structures are reproduced in Thai and English in a cosmeceutical product, the likes of which may be found in comparable lines of dietary supplements. This is clearly in contrast to the instance of English-to-Thai translation, in which the textual structure is usually altered to reflect Thai cultural expectations.

b) Socio-cultural norms: Translators typically comply with the Thai ST's laws and regulations by translating into English a warning message mandated by the Thai authority. In one instance, however, the translator and, perhaps, their editing team rearrange the English sentences to make them less complicated, albeit with grammatical mistakes, along with the common practice of giving warnings to users.

(9)

ST: khuan kin aahǎan làaklǎay khróp 5 mùu nay sàtsùan thîi mɔ̀sǒm penpràcam

        khamtɯan: dèk lɛ́ **satrii miikhan** mây khuan ráppràthaan **mâymiiphǒn nay kaanpɔ̂ŋkan rɯ̌u ráksǎarôok**

LT: [[You] should eat a variety of food and all five [basic] categories of food in a suitable proportion on a regular basis …

        Warning: Children and pregnant women should not eat [this]. There is no effect for disease prevention or treatment]

TT: You should eat at least 30 minutes before breakfast, eat at least 20-30 minutes before bed and should eat a variety of 5 categories in a reasonable proportion on a regular basis.

        Warning: a woman who is pregnant, and **a Breastfeeding woman** [*sic*] should not take this pill. **No have** [*sic*] **result in the prevention or cure.**

Example (9) is a clear case of hiring incompetent translators for such a serious medical translation project. The grammatical errors are found in the use of a capitalised letter (*a Breastfeeding woman*) and word-for-word translation (*no have result* that should have been translated as '[the product] is not intended for disease prevention or cure'). Interestingly, this instance has more to do with an incompetent translator and meagre quality assurance than the duplication of the ST 'pattern' that yields non-lay-friendly translation.

c) Cultural-specific items (CSIs): CSIs involve many aspects of living, such as aesthetics, history, religion and measurement units. Their functions and connotations always bring about a translation problem because they are perceived differently in diverse cultures (Aixelà 1996, 58; see also Phanthaphoommee and Ungsitipoonporn 2022, 13). In our case, the majority of drugs produced domestically are likely to be made from herbs or locally sourced ingredients. The specific details and symptoms described in the ST labels are primarily related to local culture and traditional medicine. Accordingly, the textual manipulation in the example below demonstrates how the translator strives to remedy the lost meaning by using a more specific English register.

(10)

(a)   ST: kêɛ **rɔ́ɔnnay kháy kràsǎy kràhǎaynáam** lɛ́ carəənaahǎan

[For relieving internal heat, fever, thirst and [stimulating] appetite]

      TT: Relief of fever, acts [*sic*] as an appetite stimulant and **diuretic**.

(b)   ST: wíthiicháy: cháy khráŋ lá 1-2 phɛ̌ɛŋ wan lá 3 khráŋ kɔ̀ɔnaahǎan lɛ́ dùum náamtaam mâak mâak dèk lót khrɛ̂ŋ **mûa ráppràthaan yaa khuan ŋót aahǎan phèt man rót càt tàaŋ tàaŋ chûakhraaw**

[Indication: Use 1-2 packages, three times a day, before a meal and drink a lotof water. Children take a half dose. **When taking this drug, [you] should temporarily refrain from spicy, oily and strong-taste foods**]

      TT: Direction: take 1-2 packets before meals with warm water. Children take half dose.

In (10a), the translator shortens the string of symptoms that contains cultural-specific items (*rɔ́ɔnnay*, *kràsǎy*, *kràhǎaynáam*) into *Relief of fever*, and adds the term *diuretic* to compensate the loss of certain CSIs. However, (10b) is an example of removing content that the translator might have considered unnecessary from the standpoint of those unfamiliar with such characteristics of food.

5   Discussion and Conclusion

The findings from textual analysis reveal distinct translation procedures for medical information between translations from Thai to English and English to Thai. In general, DILs and labels sold in Thailand, regardless of their source language, are comparatively user-friendly, especially in terms of their textual structure and sentences, as evidenced by the translators' tendency to use general terms, give explanations and glossing, summarise the clauses, and add norm-stricken idioms used in Thai medical texts. Many cases, however, may be considered unfriendly to the layperson due to transliteration, the direct transfer of field-specific terms, and the use of Thai medical vocabularies derived from Pali-Sanskrit.

One plausible explanation for the emergence of some elements of lay-friendliness is the intention of the text producers and translators to make the text as readable as possible. Nevertheless, there appears to be a competing intention of providing accurate medical information, as suggested by Gal and

Prigat (2005, 489), which may inadvertently lead to a mixture of lay-friendliness and non-lay-friendliness in a single translated text, or what we call 'less than lay-friendly translation' in our case. Considering the translator's role, we can surmise that the pharmacists-*cum*-translators (to use Jensen and Zethsen's term) may be unable to keep the DIL at the appropriate degree of formality and specificity or adapt it as needed. Medical professionals who lack training in translation may believe literal translation to be the ideal translation strategy if they are tasked with translating. This might be because some professionals view specialised vocabulary as the most crucial element of translation while grammar and semantics are viewed as secondary considerations to the extent that cohesion and coherence are ignored (González Davies 1998, 100).

Furthermore, our findings can illustrate Askehave and Zethsen's (2002, 28) concept of *skopos* (purpose) conflict in medical texts at the contextual level. On the one hand, some medical authorities who lack translation expertise may favour close-match translation procedures to deliver correct information. The drug producers, on the other hand, strive to make the approval process swift and smooth, resulting in compliance with the authority's preferred (non-lay-friendly) translation choices. This supposition is confirmed by a manager at one of Thailand's translation centres offering services to people needing an authorised medical translation from certified agencies. In her dealings with pharmaceutical companies, the manager learned that medical experts tend to decline such time-consuming and poorly compensated translation work for economic reasons. On many occasions, the task is thus delegated to a few experienced translators or, worse yet, many lay translators who may have limited medical language competence (personal communication on October 2022). This *skopos* conflict is further complicated by the Thai custom of employing Pali-Sanskrit terminology in medical-related texts, which contradicts the promotion of lay-friendliness.

Regarding product types, the leaflets or labels for both imported and locally-produced drugs tend to follow the original pattern. This could be because some drugs (such as a vaccine) are always presented with a high level of expert language and extensive information, implying that they are potentially designed for professional usage. These findings are similar to those in studies by Montalt Resurrecció and Shuttleworth (2012) and Karwacka (2014), who similarly maintain that some DILs inevitably contain medical jargon and have a competing intention for expert use. However, passivisation and nominalisation, which might lead to a mixture of lay-friendliness and non-lay-friendliness, was found in some cases. Possible explanations for the translation shift involve Thai discourse factors that influence translators' use of

zero anaphors, such as meaning interpretation and the naturalness of the Thai language (cf. Pathanasin and Aroonmanakun 2014; Phanthaphoommee 2022).

In contrast, the leaflets and labels for cosmeceutical products possess two distinguishing characteristics. First, such documents for this product type, especially those sold in convenience stores, can be regarded as hybrid text types. When translated, they attempt to be both informative and persuasive in the target cultural context. Some changes in modality, mostly found in products such as hair serum or shower gel for sensitive skin, alter the original's interpersonal meanings. The second is concerned with Thai norms: the use of Thai euphemisms and the addition of information or warning. Such a pattern is frequently observed in dietary supplement products and is similar to findings in Nisbeth Brøgger's (2017) study in that certain contextual limitations of products and processes, such as those presented by commissioners or the relevant authority in the target culture, can be imposed on the final translated texts.

Another noteworthy point that distinguishes Thailand from medical translation studies in other countries is in labels for Thai-made medications. It is typical of drugs, particularly cosmeceutical products and local herbs, that Thai laypeople can easily obtain. This type of drug-related product typically provides basic medical information on the bottle's box or label, with no package insert. The description of necessary medical information on such products as painkillers or fever relievers appears to be concise, easy to follow and conforms to the ST structure. We contend that the Thai-to-English translation of labels is likely to contain fewer technical terms but more shifts in culture-specific items. One point should be underlined. Since the patterns and structures of the Thai and English labels in this type of product are strikingly similar, it is difficult to determine whether the DILs and labels were written first in Thai and then translated into English or vice versa. The researchers can only compare their features based on the presentation of medical information in the two versions.

Although this research limits its scope only to textual analysis, it still contributes to the knowledge of medical translation in Thailand as a whole by showing the possibility of improvement in the translation strategies of these medical texts to make them lay-friendly and more understandable, which can eventually lead to the safer use of drugs. Such a social implication in our study serves as a stepping stone for further text-focused research that can yield more insights into the translation process, a translator's preferred strategy, or the availability of translation resources. Interested researchers are also encouraged to expand the scope of the present study to analyse the context of medical

translation in Thai society. It is equally important to see if the network of both expert and non-expert medical translators can work together to establish far stronger connections and the prospect of developing medical translation courses. Further research can also be done by comparing our interpretation of the findings with other Thai medical contexts, including those regarding translator training and national policy on drug and cosmeceutical products.

References

Aixelà, Javier Franco. 1996. "Culture-specific Items in Translation. In *Translation, Power, Subversion*, edited by Román Álvarez Rodríguez and M. Carmen-África Vidal, 52–78. Clevedon: Multilingual Matters.

Askehave, Inger, and Karen Korning Zethsen. 2000. "Medical Texts Made Simple – Dream or Reality?" *HERMES – Journal of Language and Communication in Business* 13(25): 63–74. https://doi.org/10.7146/hjlcb.v13i25.25585.

Askehave, Inger, and Karen Korning Zethsen. 2002. "Translating for Laymen." *Perspectives: Studies in Translatology* 10(1): 15–29. https://doi.org/10.1080/0907676X.2002.9961431.

Askehave, Inger, and Karen Korning Zethsen. 2003. "Communication Barriers in Public Discourse: The Patient Package Insert." *Document Design* 4(1): 22–41. https://doi.org/10.1075/dd.4.1.03ask.

Askehave, Inger, and Karen Korning Zethsen. 2008. "Mandatory Genres: The Case of European Public Assessment Report (EPAR) Summaries." *Text & Talk* 28(2): 167–192.

Askehave, Inger, and Karen Korning Zethsen. 2014. "A Comparative Analysis of the Lay-friendliness of Danish EU Patient Information Leaflets from 2000 to 2012." *Communication and Medicine* 11(3): 209–222. https://doi.org/10.1558/cam.v11i3.20700.

Burapadaja, Siriporn, Pariya Tantipathananandh, and Busaban Sirithunyalug. 2004. "Consumer's Opinions on Reading a Medicine Leaflet. *Chiang Mai University Journal* 3 (2): 155–167. https://cmuj.cmu.ac.th/uploads/journal_list_index/30857286.pdf.

Ezpeleta Piorno, Pilar. 2012. "An Example of Genre Shift in the Medicinal Product Information Genre System." *Linguistica Antverpiensia, New Series – Themes in translation Studies* 11: 139–159. https://doi.org/10.52034/lanstts.v11i.302.

Gal, Iddo, and Ayelet Prigat. 2005. "Why Organisations Continue to Create Patient Information Leaflets with Readability and Usability Problems: An Exploratory Study." *Health Education Research* 20(4): 485–493. https://doi.org/10.1093/her/cyh009.

González Davies, Maria. 1998. "Student Assessment by Medical Specialists: An Experiment in Relating the Undergraduate to the Professional World in the Teaching of

Medical Translation in Spain." In *Translation and Medicine*, edited by Henry Fischbach, 93–102. Amsterdam: John Benjamins.

Grabowski, Łukasz. (2015). "Keywords and Lexical Bundles within English Pharmaceutical Discourse: A Corpus-driven Description." *English for Specific Purposes* 38: 23–33. https://doi.org/10.1016/j.esp.2014.10.004.

Jarernsiripornkul, Narumol, Sireerat Nakboon, Kobkaew Anarj, and Kamonphat Wongtaweepkij. 2020. "Survey of Healthcare Professionals' Practices, Expectations, and Attitudes towards Provision of Patient Information Leaflets in Thailand. *International Journal of Clinical Pharmacy* 42(2): 539–548. https://doi.org/10.1007/s11096-020-00965-x.

Jensen, Matilde Nisbeth. 2013. "Translators of Patient Information Leaflets: Translation Experts or Expert Translators?: A Mixed Methods Study of Lay-Friendliness." PhD diss., Aarhus University, Denmark. https://pure.au.dk/portal/files/55635800/Matilde_Nisbeth_Jensen_PhD_AU_final.pdf.

Jensen, Matilde Nisbeth. 2015. "Optimising Comprehensibility in Interlingual Translation: The need for Intralingual Translation." In *Translation and Comprehensibility*, edited by Karin Maksymski, Silke Gutermuth, Silvia Hansen-Schirra, 163–194. Berlin: Frank & Timme.

Jensen, Matilde Nisbeth, and Karen Korning Zethsen. 2012. "Translation of Patient Information Leaflets: Trained Translators and Pharmacists-*cum*-translators – A Comparison." *Linguistica Antverpiensia. New Series – Themes in Translation Studies* 11: 31–49. https://doi.org/10.52034/lanstts.v11i.295.

Kamran, Hamza, Hadi Hassan, Mehr Un Nisa Ali, Danish Ali, Moizzuddin Taj, Zara Mir, Munj Pandya, Shirley R. Steinberg, Aamir Jamal, and Mukarram Zaidi. 2022. "Scoping Review: Barriers to Primary Care Access Experienced by Immigrants and Refugees in English-Speaking Countries." *Qualitative Research Journal* 22(3): 401–414. https://doi.org/10.1108/QRJ-02-2022-0028.

Karwacka, Wioleta. 2014. "Quality Assurance in Medical Translation." *Journal of Specialised Translation* 21: 19–34.

Karwacka, Wioleta. 2015. "Medical Translation". In *Ways to Translation*, edited by Łukasz Bogucki, Stanisław Goźdź-Roszkowski, and Piotr Stalmaszczyk, 271–298. Kraków: Jagiellonian University Press.

Kronvall, Maria. 2017. "Translating Emergency Medicine from English to Swedish: A Translation Study on Noun Compounds in Medical Terminology." MA diss., Linnaeus University, Sweden. http://lnu.diva-portal.org/smash/get/diva2:1111294/FULLTEXT01.pdf.

Liu, Wei, Elizabeth Manias, and Marie Gerdtz. 2014. "Exploring Power Relations Embedded in Medication Communication Processes on General Medical Wards." *Qualitative Research Journal* 14(2): 161–178. https://doi.org/10.1108/QRJ-06-2013-0041.

Maat, Henk Pander, and Leo Lentz. 2010. "Improving the Usability of Patient Information Leaflets." *Patient Education and Counseling* 80(1): 113–119. https://doi.org/10.1016/j.pec.2009.09.030.

McCray, Alexa T. 2005. "Promoting health literacy." *Journal of the American Medical Informatics Association* 12(2): 152–163. https://doi.org/10.1197/jamia.M1687.

Montalt Resurrecció, Vicent, and Maria González Davies. 2006. *Medical Translation Step by Step: Learning by Drafting*. London: Routledge.

Montalt Resurrecció, Vicent, and Shuttleworth, Mark. 2012. "Research in Translation and Knowledge Mediation in Medical and Healthcare Settings." *Linguistica Antverpiensia, New Series – Themes in Translation Studies* 11: 9–29. https://doi.org/10.52034/lanstts.v11i.294.

Montalt, Vicent, Karen Korning Zethsen, and Wioleta Karwacka. 2018. "Medical Translation in the 21st Century – Challenges and Trends." *Current Challenges and Emerging Trends in Medical Translation. MonTI* 10: 27–42. https://doi.org/10.6035/MonTI.2018.10.1.

Newmark, Peter. 1979. "A Layman's View of Medical Translation.*" British Medical Journal* 2(6202): 1405–1407. https://doi.org/10.1136/bmj.2.6202.1405.

Nisbeth Brøgger, Matilde. 2017. "When Translation Competence Is Not Enough: A focus Group Study of Medical Translators." *Meta* 62(2): 396–414. https://doi.org/10.7202/1041030ar.

Nisbeth Brøgger, Matilde and Karen Korning Zethsen. 2021. "Inter- and Intralingual Translation of Medical Information: The Importance of Comprehensibility." In *The Routledge Handbook of Translation and Health*, edited by Şebnem Susam-Saraeva and Eva Spišiaková, 96–107. London: Routledge.

Pathanasin, Saranya, and Wirote Aroonmanakun. 2014. "A Centering Theory Analysis of Discrepancies on Subject Zero Anaphor in English to Thai Translation." MANUSYA: *Journal of Humanities* 17(1): 45–63.

Phanthaphoommee, Narongdej. 2022. "Translation of Pronouns and Deictic Positioning in the Thai Prime Minister's Weekly Addresses." KEMANUSIAAN: *The Asian Journal of Humanities* 29(2): 27–47. https://doi.org/10.21315/kajh2022.29.2.2.

Phanthaphoommee, Narongdej, and Siripen Ungsitipoonporn. 2022. "Translation for Language Revitalisation: Efforts and Challenges in Documenting Botanical Knowledge of Thailand's Northern Khmer Speakers." *Multilingua*. https://doi.org/10.1515/multi-2022-0040.

Phueanpinit, Pacharaporn, Narumol Jarernsiripornkul, Juraporn Pongwecharak, and Janet Krska. 2014. "Hospital Pharmacists' Roles and Attitudes in Providing Information on the Safety of Non-Steroidal Anti-inflammatory Drugs in Thailand. *International Journal of Clinical Pharmacy* 36(6):1205–1212. https://doi.org/10.1007/s11096-014-0018-7.

Pongpunna, Supawinee, Thongchai Pratipanawatr, and Narumol Jarernsiripornkul. 2019. Survey of Outpatients' Use and Needs of Patient Medicine Information Leaflets in Thailand. *International Journal of Clinical Pharmacy* 41: 141–150. https://doi.org/10.1007/s11096-018-0748-z.

Sukpanichnant, Sanya. 2008. "The history of Thai medical terminology [ความเป็นมาของศัพท์แพทย์ภาษาไทย]." *Siriraj Medical Bulletin* 1(2): 91–104. https://he02.tci-thaijo.org/index.php/simedbull/article/download/82109/65262.

Valdez, Susana, and Sonia Vandepitte. 2020. "Exploring a Two-Way Street: Revisers' and Translators' Attitudes and Expectations about Each Other in Biomedical Translation." In *Translation Revision and Post-Editing*, edited by Maarit Koponen, Brian Mossop, Isabelle S. Robert, Giovanna Scocchera, 148–164. London: Routledge.

Vinker, Shlomo, Vered Eliyahu, and John Yaphe. 2007. "The Effect of Drug Information Leaflets on Patient Behavior." *The Israel Medical Association Journal* 9(5): 383–386.

Wongtaweepkij, Kamonphat, Janet Krska, Juraporn Pongwecharak, and Narumol Jarernsiripornkul. 2020. "Experiences and Views of Medicine Information among the General Public in Thailand." *Patient Preference and Adherence* 14: 1073–1082. https://doi.org/10.2147/PPA.S257454.

Zethsen, Karen Korning. 2004. "Latin-based Terms: True or False Friends?" *Target* 16: 125–142. https://doi.org/10.1075/target.16.1.07zet.

Zethsen, Karen Korning. 2018. "Access Is Not the Same as Understanding. Why Intralingual Translation Is Crucial in a World of Information Overload." *Across Languages and Cultures* 19(1): 79–98. https://doi.org/10.1556/084.2018.19.1.4.

Zimmermann, Maria, and Regina Jucks. 2018. "How Experts' Use of Medical Technical Jargon in Different Types of Online Health Forums Affects Perceived Information Credibility: Randomised Experiment with Laypersons." *Journal of Medical Internet Research* 20(1): e30. https://doi.org/10.2196/jmir.8346.