



# Community accessibility of health information and the consequent impact for translation into community languages

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**Abstract:** This paper reports on a research project that investigated the accessibility of health information and the consequent impact for translation into community languages. This is a critical aspect of the mediation of intercultural and interlingual communication in the domain of public health information and yet very little research has been undertaken to address such issues. The project was carried out in collaboration with the New South Wales Multicultural Health Communication Service (MHCS), which provides advice and services to state-based health professionals aiming to communicate with non-English speaking communities. The research employed a mixed-method and action research based approach involving two phases. The primary focus of this paper is to discuss major quantitative findings from the first pilot phase, which indicated that there is much room to improve the way in which health information is written in English for effective community-wide communication within a multilingual society.

**Keywords:** Plain English, translation accessibility, community translation, public health information

## 1. Introduction

In a multilingual and multicultural society such as Australia, effective community-wide communication among diverse groups of language speakers with different cultural backgrounds is a constantly challenging issue. One of the areas where it is of significance is in the health and medical fields. In New South Wales, the Multicultural Health Communication Service (MHCS) takes a leading role on meeting the health information needs of Australians from a wide range of language backgrounds. It provides advice and services to state-based health professionals aiming to communicate with non-English-background speakers. A central question for this organisation is the quality of the information that is written in English for subsequent translation into different community languages. Despite the organisation's advocacy of the use of Plain English (personal communication, April 2007), a major concern is the written quality and readership accessibility of health-related texts written in English, which are used as the basis for translations into a number of different languages used in the community. In particular, there is a view that the role of Plain English in the preparation of translated materials appears to be misunderstood and underestimated.

This paper describes a collaborative project undertaken by the authors with professionals from the MHCS and from the translation and interpreting field. The project was designed, first, to analyse and investigate the comprehensibility to the community of health information written in English; second, to examine the impact on translation into other languages and third, to survey the usefulness of health information perceived by the general public who have different linguistic and cultural backgrounds. This paper will address the first issue on the basis of a linguistic analysis with two English

texts and the second and third ones discussing quantitative results of a survey conducted with the general public who speak English, Chinese, or Korean as their mother tongue. Very little research has been undertaken to investigate issues of community accessibility of health information and the consequent impact for translation into community languages. Thus, the study was conceived as a pilot project to begin investigation of the issues mentioned above.

## 2. Research design

This pilot phase was carried out through four steps. First, following extensive linguistic analysis of 30 health related texts currently used within the community, we selected two texts that were agreed by the whole project team to be less accessible English texts. The two texts were *Men who Smoke* (T1) and *Do you Have a Breast Change?* (T2) (see Appendix 2). These texts were also selected because they deal with high profile health issues within the community. Second, the two texts were revised for greater accessibility using the considerations of multiple domains of meaning drawing on systemic functional linguistics (see Section 3). Third, the two original texts (V1s) as well as their revised versions (V2s) were translated into Chinese and Korean by two professional translators (see Appendices 3 and 4). The translations were then each checked by another professional translator. Finally, a survey was conducted of approximately 100 readers from English, Chinese and Korean-speaking communities respectively. In the survey, the original and revised versions of the texts were presented to investigate their reactions to the different versions, and specifically, the extent of the accessibility of the information.

## 3. Text revision

Plain English is often defined by its proponents as the antithesis of “gobbledegook” or “jargon”. Eagleson (1990, p. 4) provides the following description:

In short it is the opposite of gobbledegook and of confusing and incomprehensible language. Plain English is clear, straightforward expression, using only as many words as are necessary. It is language that avoids obscurity, inflated vocabulary and convoluted sentence construction. It is not baby talk, nor is it simplified version of the English language.

Writers of plain English let their audience concentrate on the message instead of being distracted by complicated language. They make sure that the audience understands the message easily.

All of this is excellent advice; however, in perusing more closely the nature of the specific advice put forward in policy guidelines, we see a number of problematic areas of interpretation.<sup>1</sup>

First, it may be difficult for health professionals who are usually highly educated to place themselves in the position of readers with very varied levels of literacy in their first and second languages. Thus, advice tends to be

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<sup>1</sup> For example, Appendix 1 lists the advice currently provided by the Plain English Foundation, <http://www.plainenglishfoundation.com>.

targeted at a “generic reader” who may be assumed to have similar levels of literacy. Health information by its very nature often requires the use of technical and specialist language (the “jargon” referred to). Finding alternatives to technical and “long” words, rather than employing them within clearly written linguistic structures, where they are glossed or defined, could result in misleading substitutes and inaccurate information. It may also be difficult for writers to distinguish between what might constitute “clutter” and what might constitute the appropriate level of detail to provide sufficient information. In addition, balancing formality and friendliness of tone is a judgement that must be made by writers who may not have extensive insight into how to manipulate linguistic resources to set an appropriate tone. As a result, overuse of familiarity in presenting information could become alienating. Though overuse of the passive voice might result in dense impenetrable information, of itself it is not necessarily inappropriate. The most specific advice is offered at the sentence and word level in relation to sentence word quantities (writers may also be advised to “use verbs rather than nouns”); however, this advice may fail to take into account the nature of the topic and the level of detail required in sentence construction.

In addition, as linguists working within a theoretical framework of systemic functional linguistics (Halliday, 1994; Halliday and Matthiessen, 2004), we are aware that content may be changed in the process of rewriting. Nevile (1990) shows that text rewritten in Plain English may have changed content and argues that “if one is to rewrite a text in order to increase its readability, a great deal of caution is needed to preserve the content of the original” (Nevile, 1990, p. 36). Accordingly, our analytical approach to written texts is to explore them at four semantic levels: experiential, logical, interpersonal and textual to maintain the content of the original as much as possible. Instead of following a particular set of rules like those suggested for Plain English, in the revised versions of the texts we took into account how **experiential** meanings (i.e. who did what how and why, etc) are delivered: i) with clear **logical** relations between clauses that are not too complicated; ii) in an **interpersonally** appropriate tone; iii) within a coherent **textual** structure.

The linguistic analysis of the two selected texts showed that problems embedded in the texts could largely be categorised at two levels: the macro-level and the micro-level. The macro-level involved the overall textual structure of the text in terms of the genre or text type. In the Breast Change text for example, the information was provided in the form of question posing. In response to the first question, *What causes a breast change?*, the information did not actually describe the causes of change, but rather stated that *breast changes are not an automatic indicator of breast cancer*. The information on hormonal change, however, did suggest what causes breast changes. The information on cysts described not so much causes of breast changes but kinds of breast changes, while information on breast cancer was more related to how breast cancer occurs. Thus, in the original version of the text we found a mismatch between the question forms and the functional information supplied to respond to the question. However, we did not foreground this issue when revising the text. The primary reason is that we were not sure whether this is a textual structure that is typical in medical discourse. When we asked a linguist who was also originally trained in medicine for his opinions about this macro textual issue, he said it did read like typical medical information texts. While we were aware of the need to explore features of medical texts in detail, that analysis was beyond the scope of the pilot project.

At the micro-level we noticed problems primarily in three domains of

meaning, experiential (who did what etc.), logical (relations between clauses) and interpersonal (formality, personal attitude etc.). They will be briefly explained with the following example, which is a response labeled *Fact* in the Men Who Smoke text to the *Myth, I'm fit and healthy, smoking won't affect me*. The combination of nominalisations and nominal groups that contain an embedded logical relation within them makes the original texts highly complicated to understand. Thus, the complexity of the original texts was firstly addressed in the revised texts experientially. The original text presented below, for instance, uses a number of nominalisations such as *reduced oxygen uptake, shortness of breath, reduced endurance* and *poorer visual judgment*. In order to reduce the density of information through the use of nominalisation, the experiential meanings of the nominalised items were unpacked into clauses in the revised text (e.g. *when you take in less oxygen*).

### Example texts

#### *Original*

Carbon monoxide in cigarette smoke attaches readily to the substance in the blood responsible for transporting oxygen to the cells (haemoglobin). This means the blood is less able to carry oxygen around the body. Reduced oxygen uptake results in less oxygen being available for working muscles, which in turn reduces endurance. During exercise smokers are more easily exhausted, suffer shortness of breath, have reduced endurance and are slower to react.

#### *Revised*

When you smoke, a chemical in cigarette smoke called carbon monoxide attaches itself to your haemoglobin. Haemoglobin is the substance in the blood which carries oxygen to your cells. Therefore smoking means the blood is less able to carry oxygen around the body. When you take in less oxygen, you have less oxygen for your muscles to work and this reduces your fitness and stamina. This is why during exercise smokers are easily exhausted, short of breath and slow to react.

Another consideration taken into account to make sure a message was accessible in the domain of experiential meaning was how much knowledge could be assumed. For example, the original text seems to assume that the target reader already knows terms such as carbon monoxide as it starts with this technical term without an explanation. However, in the revised text, carbon monoxide is not treated as a common-sense term but as a specialised term and therefore the meaning is introduced as *a chemical in cigarette smoke called carbon monoxide* before the term is mentioned.

In terms of the domain of logical meaning, clauses embedded within nominal groups were elevated to rank clauses in order to deliver the experiential message in a more manageable amount per sentence. In the above example texts, for instance *less oxygen [[being available for working muscles]]*, which is a long nominal group with an embedded clause, was revised into *you have less oxygen for your muscles to work*. The revised text also addresses an interpersonal issue, as in the original there is a disjuncture in register between the conversational style of the Myth statements and the explanations provided which are written in a very technically medical style. The lexicogrammatical features that typify conversational registers are not carried through. For instance, the myths statements are written in an informal way using the first person pronoun "I" but the responses are written in an abstract, formal and scientific way where there is little use of first or second personal pronouns. In the revised text, the second person pronoun "you" is

employed as much as possible to maintain the informal tone set in the Myth statements. One may argue that this subtle interpersonal issue has little to do with Plain English. However, this is certainly an important domain of meaning that needs to be addressed carefully in any text to make sure the purpose of the text is achieved. In the texts selected for the study, it is one of the linguistic features that could deter the target reader from reading the text, which works against the intention of public health information.

This brief illustration intends to show that it requires more than a set of rules to communicate information or messages clearly in written form in the public health domain. Contextual information such as the purpose of the communication (e.g. expounding, enabling or recommending) and the assumed educational level of the public is vital in determining how language should be used to convey multidimensional meanings.

#### 4. Translation

The two original texts (V1s) as well as their revised versions (V2s) were translated into Chinese and Korean by two professional translators. The Chinese translator had over 20 years experience of translating in the Australian context while the Korean translator had more than 10 years' experience of translating, but not within Australia. Reflecting on the Skopos theory that translation strategies should vary depending on the purpose of the translation (Reiss and Vermeer, 1984), they were given a translation brief about the translation task. Although they were informed about the project, they were asked to translate each text as they would usually do with a translation brief. They were allowed to use whatever resources they normally use and given four hours to complete the translations. They were then given a week to revise their translations and send them back to the researchers electronically. The translations were checked by another translator and they were revised in consultation with the original translators.

In their post-translation interviews, both translators indicated that they chose to translate as faithfully as possible to the source texts following the same sequence of information and without adding or omitting any information. However, they also chose to make translation shifts (cf. Catford, 1967) when they were necessary to make their translations easier to read. They tended to make more shifts when they translated the original versions than the revised ones. For instance, both Chinese and Korean translators translated the revised version of the Men Who Smoke passage in Section 3 without making any translation shifts but made a fairly major translation shifts when they translated *Reduced oxygen uptake results in less oxygen being available for working muscles, which in turn reduces endurance* in the original version as follows:

##### Chinese

由於細胞所吸收的氧氣減少了，勞動肌肉所得到的氧氣也會相對減少，於是導致耐勞力下降。

Back translation: Oxygen uptake reduces, so does oxygen needed for muscles, which lead to endurance reduction.

##### Korean

산소 흡입량이 줄어들에 따라 근육활동에 필요한 산소가 부족하게 되고 그렇게 되면 몸의 지구력이 떨어지게 됩니다.

Back translation: As oxygen uptake reduces, oxygen needed for working muscles becomes insufficient and then the body's endurance reduces.

Both translators translated the nominal groups, *Reduced oxygen uptake* and *less oxygen being available for working muscles*, as clauses. The original English text was revised in the same manner to make the information more accessible. This is one of examples that show both professional translators made translation shifts considering the accessibility to the target reader of their translated texts.

## 5. Survey

With two sets of the texts (original and revised) in each language concerned (English, Chinese and Korean), a survey was conducted of 246 participants in total. The survey consisted of two parts. The first part was a semi-structured interview format. The participants were asked questions on the readability of both texts, *Men who Smoke* (T1) and *Do you Have a Breast Change?* (T2). The original (V1) was compared with the revised version (V2) for each text. In the second part, they were asked closed questions about demographics including gender, age, education and length of time living in Australia. They were also asked to express their opinions in general about the accessibility of health information that is distributed in Australia. The participants' demographic information and their preference choices will be discussed in Sections 5.1 and 5.2 respectively and their opinions about the accessibility of health information in Section 5.3.

### 5.1. Respondent demographics

Of 246 participants, there were 98 respondents whose first language is English; 75 whose first language is Chinese; and 73 whose first language is Korean. Age and gender were the first demographic categories. The majority of respondents were between the ages of 25 – 60 and those over 60 were under-represented as shown in Table 1. There was double the number of female respondents than male for each language group.

Table 1: Age and gender of the respondents

		Age				Totals
		18–24	25–40	41–60	Over 60	
Language Group (Male: Female)	English Speakers (33:65)	23	29	41	5	98
	Korean Speakers (21:52)	10	34	29	0	73
	Chinese Speakers (21:54)	14	35	22	4	75

Education was another factor thought to be relevant for comparing the accessibility of the different versions of the texts. This was considered an important category in our interpretation of results due to variables impacting opinions arising from literacy levels, based on the influence of the formality and degree of educational training. The respondents showed a range of educational backgrounds but those with only secondary education tended to

be under-represented.

Table 2: Education

	Secondary	Tertiary	Postgraduate
English speakers	12	53	33
Chinese speakers	9	42	24
Korean speakers	7	41	25

The participants were also asked how long they had been in Australia and whether or not they speak any other languages. Sixty-nine of the total 98 who identified themselves as first language English speakers were born in Australia and the rest were born in other English-speaking countries such as the UK and US. Out of the total 98 of English native speakers, 28 said that they could speak another language fluently. Meanwhile, the majority of the Korean and Chinese speaking respondents had been in Australia between 1 and 20 years. The results for fluency in a language other than their first language were much higher than for the English first language speakers with 65 out of 75 Chinese speakers and 44 out of 73 Korean speakers stating they could speak another language fluently. The other language in most cases was English.

Table 3: Length of time in Australia

	Less than 1 yr	1-5 yrs	6-10 yrs	11-20 yrs	Over 20 yrs	Born in Australia
English	3	4	9	5	8	69
Chinese	9	28	15	21	2	0
Korean	8	22	22	14	7	0

## 5.2. Survey results for readability

The participants were presented with two versions of each text and asked to choose the version that they found easier to understand. Comparing preferences for ease of understanding for both versions of the two texts from each language group, there is a clear preference for the revised versions to the original texts in all the language groups. The results on both texts are presented in Table 4. With respect to the first text *Men Who Smoke*, responses were noted for 55 English native speakers, 53 Korean native speakers and 50 Chinese speakers. All groups preferred the revised version (V2). Out of the three groups the preference rate of the English group (65.5%) is higher than those of the Chinese (50%) and Korean (49.5%) groups. Less than 10% of those surveyed in all three groups felt there was no difference between V1 and V2 in being easier to understand.

Table 4: Percentages of preferences for text versions (unit: %)

	English		Korean		Chinese		Combined	
	T1	T2	T1	T2	T1	T2	T1	T2
V1	29.1	24	41.5	20.8	30	34	33.5	26
V2	65.5	66	49.5	73.6	56	50	57	63
No difference	5.5	10	9.4	5.7	14	16	9.5	10.5

As for the second text, *Do you Have a Breast Change?*, responses were noted for 50 English native speakers, 53 Korean native speakers and 48 Chinese speakers. Again all groups found the revised version (V2) easier to understand. However, there were two noticeable outcomes from the Korean and Chinese responses. For the Korean language group, V2 of T2 was

preferred by nearly 74% of the participants. This is a significant preference towards V2 as being more accessible. The Chinese group, on the other hand, had a less marked preference for either V1 or V2 (34%: 50%) with 16% identifying that there was no difference in accessibility of the text for either V1 or V2.

Demographic variables (age, gender, education, duration of stay in Australia, etc.) did not appear to play a critical role in determining a preferred version. However, certain groups such as those over 60 and those with secondary education only were under-represented in the study and therefore the results cannot be generalised and need to be investigated again in the next phase of the research.

Table 5: V2 preference ratios by the order of presentation of different versions

Order presented	English speakers		Korean speakers		Chinese speakers	
	T1	T2	T1	T2	T1	T2
V1^V2	74%	63%	61%	79%	67%	61%
V2^V1	50%	68%	36%	67%	46%	41%

It seems, however, that the order of presentation of the two versions of each text did appear to affect preference for accessibility. Roughly half of the participants were presented with the original version (V1) followed by the revised version (V2) (V1^V2) and the other half in the reverse order (V2^V1) to avoid any potential cognitive influence of their exposure to the first version on their perception of the second version. When the preference ratios for V2 were examined in each of two sub-groups divided by the order that the two versions were read (either V1^V2, or V2^V1 – where, ^ means ‘followed by’), the groups that read V1 and then V2 showed higher ratios of V2 preference. This would indicate that the accessibility is also influenced by the amount of previous exposure to the content, as well as by the text itself (where results differed more for T1 than T2) (see Table 5). In other words, some respondents might have felt V2 was easier to understand because they processed the same information in V1. However, in whatever order the two different versions of each text were presented, the revised versions were preferred in all three language groups.

### 5.3. *Opinions on public health information*

The participants were asked for their opinions in general on public health communication published by the Australian government. When they were asked how often they read health information brochures or pamphlets published by the government only about half of the respondents from all the different language groups claimed to read them frequently or sometimes and the other half to read them rarely or not at all.

Table 6: Frequency of reading health information

	Frequently		Sometimes		Rarely		Not at all	
English	8	8%	49	50%	22	22%	19	19%
Chinese	7	9%	25	33%	26	35%	17	23%
Korean	3	4%	30	41%	24	33%	16	22%

However, more than 90% of those who had read them said that they found them to be useful or very useful. When Chinese and Korean speakers who had read health information frequently or sometimes were asked in which language they read health information, only 21% of Chinese and 26% of

Korean respondents said that they read the health information in their mother tongue and 46% of Chinese and 36% of Korean respondents said that they read in both English and their mother tongue. Considering that 41% Korean respondents (30 out of 73) did not consider themselves to be fluent speakers of English, the fact that only 26% of them read health information in Korean made us wonder if this finding reflected their dissatisfaction about the quality of community translation.

## 6. Conclusion

This paper has reported on the major findings from the quantitative data of a survey on the accessibility of two health communication texts by English, Chinese and Korean readers. In summary, the revised versions were found to be easier to understand than the original in all three language groups. This is a clear indication that there is much room to improve the way in which health information is written in English for effective community-wide communication within a multilingual society. We suggest that in research in this area there is a need to take a linguistic approach to investigate what features embedded in less accessible texts might impede accessibility. Such analysis would provide an effective foundation for developing practical guidelines for writing texts for the general public that can go beyond generalised Plain English recommendations. Further research analysing translation shifts, and the reasons for shifts made by professional translators might also shed light on the problematic features of less accessible texts. As this research has shown that a majority of those who read health information found it to be useful or very useful, it would seem advisable to ensure that health information and its translation for the community are made as accessible as possible. We hope that the findings discussed in this paper contribute to further discussions about effective community-wide health communication within a multilingual society.

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## **Appendix 1: Plain English Guidelines**

1. Always consider your readers and adapt your writing to their needs rather than your personal preferences.
2. Clearly identify your main message and don't bury it in the detail.
3. Structure your documents to put the most important information first, followed by the details.
4. Pay attention to the design and layout as much as to the language.
5. Choose a formal but friendly tone that is neither too hip nor too heavy.
6. Use short familiar words where they match your meaning, and don't dress up the text with long words just to sound impressive.
7. Prefer the active voice ('I think you can finish') rather than the passive voice ('It is suggested consideration be given to the finishing of').
8. Be ruthless on clutter, minimising words and details that add little value.
9. Write with an average sentence length between 15-20 words, but vary individual sentences between 10 and 35 words.
10. Always check your text carefully for errors in spelling, grammar and punctuation.

## Appendix 2

### Text 1: Version 1 (Original English)

#### Men Who Smoke

**Myth: I'm fit and healthy, smoking won't affect me.**

**Fact: Smoking reduces your fitness.**

Carbon monoxide in cigarette smoke attaches readily to the substance in the blood responsible for transporting oxygen to the cells (haemoglobin). This means the blood is less able to carry oxygen around the body. Reduced oxygen uptake results in less oxygen being available for working muscles, which in turn reduces endurance. During exercise smokers are more easily exhausted, suffer shortness of breath, have reduced endurance and are slower to react.

**Myth: The chemicals in cigarettes are not dangerous, smoking can't cause me harm.**

**Fact: Nicotine, carbon monoxide and tar have harmful effects on the body.**

Nicotine causes increased heart rate, which means the smoker's heart has to work much harder to produce the same effects as a non-smoker's heart. Nicotine also causes constriction of the blood vessels, resulting in reduced blood flow, and increased blood pressure.

Nicotine and carbon monoxide act on the blood, making it thicker and harder for the heart and blood vessels to transport around the body. These two chemicals also aggravate the lining of blood vessels. Damaged blood vessels mean the body's blood transport system is less efficient.

Carbon monoxide is associated with the development of coronary heart disease. It also contributes to the development of many cancers. Carbon monoxide and other chemicals in cigarette smoke paralyse the small hairs that line the airways. This means toxic substances, including some cancer causing chemicals, cannot be removed from the airway lining.

Tar is made up of a range of chemicals, some of which are known to cause cancer. Tar is also the substance in cigarettes, which yellows the teeth, hands and skin.

### Text 1: Version 2 (Revised English)

#### Men Who Smoke

**Myth: I'm fit and healthy, so smoking won't affect me.**

**Fact: Smoking reduces your fitness.**

When you smoke, a chemical in cigarette smoke called carbon monoxide attaches itself to your haemoglobin. Haemoglobin is the substance in the blood which carries oxygen to your cells. Therefore smoking means the blood is less able to carry oxygen around the body. When you take in less oxygen, you have less oxygen for your muscles to work and this reduces your fitness and stamina. This is why during exercise smokers are easily exhausted, short of breath and slow to react.

**Myth: The chemicals in cigarettes are not dangerous, so smoking can't cause me harm.**

**Fact: Nicotine, carbon monoxide and tar, the chemicals in cigarettes, are harmful to the body.**

Nicotine makes the heart rate increase. This means that your heart has to work much harder to produce the same effects as a non-smoker's heart. Nicotine also narrows the blood vessels. This reduces blood flow around your body and increases your blood pressure.

Nicotine and carbon monoxide make the blood thicker and so it becomes harder for your heart and blood vessels to carry blood around your body. These two chemicals also affect the lining of the blood vessels. When your blood vessels are damaged, your body's system for transporting blood becomes less efficient.

Carbon monoxide is related to the development of coronary heart disease and many kinds of cancer. Carbon monoxide and other chemicals in cigarette smoke

paralyse the small hairs that line your airways.

This means that toxic substances, including some other chemicals that cause cancer, cannot be removed from the lining of the airways.

Tar is made up of a range of chemicals. Some of them are known to cause cancer. Tar is also the substance in cigarettes that makes your teeth, hands and skin yellow.

## **Text 2: Version 1 (Original English)**

### **Do You Have A Breast Change?**

This information sheet is to help you better understand the cause of breast changes and the tests which may be needed to find the cause of your breast change. This information is based on what we know through research.

#### **What causes a breast change?**

Although it is quite common for women to experience breast changes, the vast majority of these breast changes are not breast cancer.

Changes to the breast may be caused by:

#### **Hormonal change**

Hormonal change may cause swollen, tender or lumpy breasts at times during a menstrual cycle, or when taking the hormonal treatment for contraception or hormone replacement therapy (HRT).

#### **Fibroadenoma**

Fibroadenoma is a smooth, firm, mobile lump made up fibrous and glandular tissue, more commonly found in younger women. They are not cancer and can usually be left alone once the tests show that it is a fibroadenoma. However, removal of the fibroadenoma by a surgeon may be necessary if it continues to enlarge or change shape.

#### **Cysts**

Cysts are fluid filled sacs found more commonly in women 35-50 years or those taking HRT. Cysts are not cancer and can be usually left alone. If the cyst is painful or is a lump which can be felt, then the fluid in it can be simply drained using a fine needle so that the lump disappears.

#### **Breast cancer**

Breast cancer occurs when abnormal cells in the breast grow out of control. It occurs more often in older women, with more than 74% of cases occurring in women 50 years and older. It is important that breast cancer is found and treated early, before cancer cells spread to other parts of the body.

## **Text 2: Version 2 (Revised English)**

### **Do you have a change in your breast?**

This information sheet will help you understand more about the causes of breast changes. The information is based on what we know from research.

#### **What causes a breast change?**

It is quite common for women to experience changes in their breasts. But most changes are not cancer.

Changes to the breast may be caused by:

#### **Hormonal changes**

Hormonal changes may sometimes cause swollen, tender or lumpy breasts. These breast changes can happen during a menstrual cycle, hormone treatment for contraception or hormone replacement therapy (HRT).

#### **Fibroadenoma**

Fibroadenoma is a smooth, firm lump in the breast that moves when you touch it. It is made up of fibrous and glandular tissue. Fibroadenomas are more common in younger women. They are not cancer and can usually be left alone once tests show that it is a fibroadenoma. However, it may need to be removed by a surgeon if it keeps getting bigger or changes shape.

**Cysts**

Cysts are sacs filled with fluid. They are more common in women aged 35 to 50, or women using HRT. Cysts are not cancer and can usually be left alone. If the cyst is painful or is a lump you can feel, the fluid in it can be simply drained. This is done with a fine needle so that the lump disappears.

**Breast cancer**

Breast cancer happens when abnormal cells in the breast grow out of control. It is more common in older women. More than 74% of cases affect women over the age of 50. It is important to find and treat breast cancer early, before cancer cells spread to other parts of the body.

## Appendix 3

### Text 1: Version 1 (Chinese translation of the original)

- 1 抽烟的男士  
2  
3 谬误：我又强壮又健康，抽烟不会对我有影响。  
4  
5 事实：抽烟会使您变得不那么强壮。  
6 香烟烟雾里的一氧化碳很容易就附在血液里负责把氧气输送到各细胞的  
7 物质血红蛋白上，於是血液较难把氧气输送到身体各部位。由於细胞所  
8 吸收的氧气减少了，劳动肌肉所得到的氧气也会相对减少，於是导致耐  
9 劳力下降。在运动时，抽烟者较容易累得精疲力竭、气促、耐劳力下  
10 降、反应较慢。  
11  
12 谬误：香烟里的化学品没有危险性，抽烟不会对我有害处。  
13  
14 事实：尼古丁、一氧化碳和焦油对身体是有害处的。  
15 尼古丁使心跳加速，於是抽烟者的心脏必须更吃力地工作，才可以达到  
16 非抽烟者的心脏所发挥的同等效用。尼古丁也会导致血管收缩，使血液  
17 的流动变得缓慢，并且血压上升。  
18  
19 尼古丁和一氧化碳影响血液，使血液变得更粘稠，并且使心脏和血管更  
20 难把血液输送到身体各部位。这两种化学品并且刺激血管的内壁。当  
21 血管损坏了，身体的血液输送系的效率就会下降。  
22  
23 一氧化碳会导致冠状动脉心脏病，也会导致许多种癌症。香烟烟雾里的  
24 一氧化碳和其他化学品使气道内壁上的纤毛瘫痪。於是不能把有毒的物  
25 质(包括一些致癌的化学品)从气道的内壁上除去。  
26  
27 焦油由多种化学品组成，其中有些化学品已知是致癌的。焦油并且是香  
28 烟内使抽烟者的牙齿、手和皮肤变黄的物质。

### Text 1: Version 2 (Chinese translation of the revised)

- 1 抽烟的男士  
2  
3 谬误：我又强壮又健康，因此抽烟不会对我有影响。  
4  
5 事实：抽烟会使您变得不那么强壮。  
6 当您抽烟时，香烟烟雾里一种名为一氧化碳的化学品会附在您的血红蛋白  
7 上。血红蛋白是血液里负责把氧气输送到各细胞的物质，因此抽烟会使血  
8 液较难把氧气输送到身体各部位。当您所吸收的氧气减少了，劳动肌肉所  
9 得到的氧气就较少，於是您就不会那么强壮，而且耐劳力就会下降。正因  
10 如此，在运动时，抽烟者容易累得精疲力竭、气促和反应缓慢。  
11  
12 谬误：香烟里的化学品没有危险性，因此抽烟不会对我有害处。  
13  
14 事实：香烟里的化学品 - 尼古丁、一氧化碳和焦油 - 对身体是有害处  
15 的。  
16 尼古丁使心跳加速，於是您的心脏必须更吃力地工作，才可以达到非抽烟  
17 者的心脏所发挥的同等效用。尼古丁也会使血管变得狭窄，这会使您的血  
18 液循环变得缓慢，并且血压上升。  
19  
20 尼古丁和一氧化碳使血液变得更粘稠，於是您的心脏和血管就更能把血液  
21 输送到身体各部位。这两种化学品并且影响血管的内壁。当您的血管损坏  
22 了，身体的血液输送系统的效率就会下降。  
23  
24 一氧化碳会导致冠状动脉心脏病和许多种癌症。香烟烟雾里的一氧化碳和  
25 其他化学品使您的气道内壁上的纤毛瘫痪，於是不能把有毒的物质(包括  
26 一些其他的致癌化学品)从气道的内壁上除去。  
27  
28 焦油由多种化学品组成，其中有些化学品已知是致癌的。焦油并且是香烟  
29 内使您的牙齿、手和皮肤变黄的物质。

## Text 2: Version 1 (Chinese translation of the original)

- 1 您的乳房有没有出现变化?  
2  
3 这份资料单张能够帮助您更了解乳房出现变化的原因。所载的资料是我们通过  
4 研究取得的。  
5  
6 乳房的变化是怎样导致的?  
7 虽然妇女乳房出现变化是甚为普遍的现象, 但绝大多数的变化都不是乳癌。  
8  
9 导致乳房出现变化的原因可能是:  
10  
11 • 激素的变化  
12 在月经期间、服用激素避孕或接受激素补充疗法 (hormone replacement  
13 therapy, 简称HRT) 期间, 激素的变化有时也许会导致乳房肿胀、触痛或出  
14 现肿块。  
15  
16 • 纤维腺瘤  
17 纤维腺瘤是平滑、结实、会移动的肿块, 是由纤维状和腺状组织组成, 在  
18 较年轻的妇女中较为普遍。这些都不是癌, 而且一旦检验证实是纤维腺  
19 瘤, 通常可以不用理会。然而, 如果该纤维腺瘤继续扩大或改变形状, 也  
20 许需要请外科医生切除。  
21  
22 • 囊肿  
23 囊肿是充满液体的囊, 在35-50岁之间的妇女或正在接受HRT疗法的妇女  
24 中较为普遍。囊肿并非癌, 通常可以不用理会。如果该囊肿是疼痛的或是  
25 可以触摸的肿块, 则可以用一支细的注射针, 把里面的液体抽去, 那么该  
26 肿块就会消失。  
27  
28 • 乳癌  
29 当乳房内的异常细胞失控增长, 就是乳癌。在年纪较大的妇女中较为普  
30 遍。超过74%的病例都是50岁或以上的妇女。在癌细胞未扩散到身体其  
31 他部位之前, 及早发现乳癌和接受治疗至为重要。

## Text 2: Version 2 (Chinese translation of the revised)

- 1 您的乳房有没有出现变化?  
2  
3 这份资料单张会帮助您更瞭解乳房出现变化的原因, 是我们从研究所得  
4 知的资料。  
5  
6 乳房的变化是怎样导致的?  
7 妇女的乳房出现变化是甚为普遍的现象, 但大多数的变化都不是癌。  
8  
9 导致乳房出现变化的原因可能是:  
10  
11 • 激素的变化  
12 激素的变化有时也许会导致乳房肿胀、触痛或出现肿块。这些乳房的  
13 变化可能会在月经期间、服用激素避孕或接受激素补充疗法 (hormone  
14 replacement therapy, 简称 HRT) 期间出现。  
15  
16 • 纤维腺瘤  
17 纤维腺瘤是乳房内平滑、结实的肿块, 触摸时会移动。纤维腺瘤是由纤  
18 维状和腺状组织组成, 在较年轻的妇女中较为普遍。这些并非癌, 而且  
19 一旦检验证实是纤维腺瘤, 通常可以不用理会。然而, 如果该纤维腺瘤  
20 继续扩大或改变形状, 也许需要请外科医生切除。  
21  
22 • 囊肿  
23 囊肿是充满液体的囊, 在 35-50 岁之间的妇女或正在接受 HRT 疗法的  
24 妇女中较为普遍。囊肿并非癌, 通常可以不用理会。如果该囊肿是疼痛  
25 的或是您可以触摸到的肿块, 可以把里面的液体抽去; 方法是用一支细  
26 的注射针抽出液体, 使肿块消失。  
27  
28 • 乳癌  
29 当乳房内的异常细胞失控增长, 就是乳癌; 这在年纪较大的妇女中较为  
30 普遍, 超过 74% 的病例都是 50 岁以上的妇女。在癌细胞未扩散到身其  
31 他部位之前, 及早发现乳癌和接受治疗至为重要。

## Appendix 4

### Text 1: Version 1 (Korean translation of the original)

#### 흡연에 대한 건강 정보

**잘못된 건강상식 1:** 신체가 건강하면 담배를 피워도 해롭지 않다.

**바로 알기:** 흡연은 신체건강에 해롭다.

담배연기 속의 일산화탄소는 혈액 중 산소를 세포로 운반하는 물질인 헤모글로빈과 쉽게 결합합니다. 이에 따라 혈액이 신체 내에서 산소를 운반하는 능력에 제한을 받게 됩니다. 산소 흡입량이 줄어들어 따라 근육활동에 필요한 산소가 부족하게 되고 그렇게 되면 몸의 지구력이 떨어지게 됩니다. 운동 시 흡연자는 쉽사리 지치고 숨이 차며, 체력이 떨어지고 각종 자극에 대한 반응이 느려집니다.

**잘못된 건강상식 2:** 담배 안에 있는 화학물질은 위험하지 않기 때문에 흡연은 해롭지 않다.

**바로 알기:** 니코틴이나 일산화탄소 및 타르는 신체에 유해하다.

니코틴은 심장박동수를 증가시킵니다. 이는 다시 말해서 흡연자의 심장이 비 흡연자의 심장과 같은 효과를 내기 위해서는 더 부지런히 작동해야 함을 의미합니다. 니코틴은 또한 혈관의 수축을 일으켜 혈류량을 감소시키고 혈압을 높이는 결과를 가져옵니다.

니코틴과 일산화탄소는 혈액을 탁하게 하여 심장과 혈관이 혈액을 몸 구석구석에 운반하기가 어려워집니다. 이들 두 화학물질은 또 혈관 벽을 손상시킵니다. 혈관이 손상되면 신체 내 물질 운반시스템의 효율성이 떨어지게 됩니다.

일산화탄소는 관상동맥질환의 발병과 무관하지 않으며, 각종 암의 발병에도 기여를 합니다. 담배연기 속의 일산화탄소 및 기타 화학물질은 기도 표면의 미세섬모를 마비시킵니다. 이렇게 되면 일부 발암 물질을 포함한 독성물질이 기도표면에서 빠져나오지 못하게 됩니다.

타르는 다양한 화학물질로 구성되어 있는데, 이들 중 일부 물질은 암을 유발하는 것으로 알려져 있습니다. 타르는 또한 담배의 한 성분으로 치아와 손 그리고 피부에 황색 착색효과를 일으킵니다.

### Text 1: Version 2 (Korean translation of the revised)

#### 흡연에 대한 건강정보

**잘못된 건강상식 1:** 신체가 건강하면 흡연은 해롭지 않다.

**바로 알기:** 흡연은 건강에 해롭다.

흡연을 할 때, 담배 연기 속에 일산화탄소라고 하는 화학 물질이 몸 안의 헤모글로빈과 결합합니다. 헤모글로빈은 혈액에 포함되어 있는 물질로 산소를 세포로 운반하는 역할을 합니다. 따라서 흡연을 하게 되면 혈액이 몸 안에서 산소를 운반할 수 있는 능력이 떨어집니다. 산소 흡입량이 줄어들면 근육활동에 필요한 산소가 부족하게 되어 건강과 체력이 저하됩니다. 이러한 이유 때문에 운동 시 흡연자의 경우 쉽게 지치고 숨이 차며 각종 자극에 대한 반응이 느려집니다.

**잘못된 건강상식 2:** 담배 안의 화학물질은 위험하지 않기 때문에 흡연은 해롭지 않다.

**바로 알기:** 담배 안에 들어 있는 니코틴, 일산화탄소 및 타르는 몸에 해롭다.

니코틴은 심장박동수를 증가시킵니다. 다시 말해서 흡연자의 심장이 비흡연자의 심장과 같은 효과를 내기 위해서는 더 부지런히 작동해야 합니다. 니코틴은 또한 혈관을 좁히는 역할을 합니다. 그렇게 되면 몸 안의 혈류량이 감소되어 혈압이 올라갑니다.

니코틴과 일산화탄소는 혈액을 탁하게 하기 때문에 심장과 혈관이 혈액을 몸 구석구석으로 운반하기가 어려워집니다. 이들 두 화학물질은 또한 혈관 벽을 손상시킵니다. 혈관이 손상되면 혈액을 운반하는 신체 체계의 효율이 떨어지게 됩니다.

일산화탄소는 관상동맥질환과 각종 암의 발병과 무관하지 않습니다. 담배연기 속의 일산화탄소와 기타 화학물질은 기도표면의 미세섬모를 마비시킵니다. 이에 따라 일부 암을 유발하는 기타 화학물질을 비롯한 독성물질이 기도표면에서 빠져나갈 수 없게 됩니다.

타르는 각종 화학물질로 이루어져 있는데, 이들 중 일부는 암을 유발한다고 알려져 있습니다. 타르는 또한 담배의 한 성분물질로서 치아와 손 그리고 피부에 황색 착색을 일으킵니다.

## Text 2: Version 1 (Korean translation of the original)

### 유방의 변화와 관련된 건강 정보

이 자료는 유방의 변화를 일으키는 원인에 대한 이해를 높이기 위해 제작되었으며 본 내용은 리서치를 통해 얻은 결과에 기반하고 있습니다.

### 유방의 변화를 일으키는 원인

일반적으로 많은 여성들이 유방의 변화를 경험하지만, 이들 중 대다수는 유방암이 아닙니다.

유방의 변화를 일으키는 요인으로는 아래의 내용이 해당될 수 있습니다.

- **호르몬의 변화**

생리 중에 있거나, 불임을 목적으로 호르몬 치료를 받는 경우 또는 호르몬 대체요법(HRT)을 받는 경우에 호르몬의 변화로 인해 유방이 부어 오르거나 유방 조직이 부드러워지거나 덩어리가 생길 수 있습니다.

- **선유섬종**

선유섬종은 섬유 조직과 선 조직으로 이루어진 표면이 매끈하고 단단한 덩어리로서 몸 안에서 옮겨다니며 일반적으로 젊은 여성에게서 많이 발견됩니다. 선유섬종은 암이 아니며 검사결과 선유섬종으로 판정되면 대개 그대로 두어도 무방합니다. 하지만 덩어리가 계속해서 커지거나 형태가 바뀌면 외과수술로 제거해야 할 것입니다.

- **낭종**

낭종은 액체로 가득 찬 작은 주머니들로 이루어져 있으며, 35세에서 50세 사이에 해당하거나 호르몬 대체요법을 받는 여성에게서 가장 많이 발견됩니다. 낭종은 암이 아니며 그대로 두어도 무방합니다. 낭종에 통증이 생기거나 덩어리가 만져질 경우에는 가는 주사바늘을 사용하여 액체를 빼내면 덩어리가 사라집니다.

- **유방암**

유방암은 유방의 비정상적인 세포가 견잡을 수 없이 자라면서 발생합니다. 유방암은 젊은 여성보다는 나이가 든 여성에게서 가장 많이 발견되는데, 74% 이상이 50세 이후의 여성에게서 발견됩니다. 암세포가 몸의 다른 부분으로 전이되기 전에 조기에 발견해서 치료하는 것이 중요합니다.

## Text 2: Version 2 (Korean translation of the revised)

### 유방의 변화에 대한 건강정보

이 자료는 유방의 변화를 일으키는 원인에 대한 이해를 높이기 위해 제작되었으며, 본 내용은 리서치 결과에 기반하고 있습니다.

### 유방의 변화를 일으키는 원인

일반적으로 많은 여성들이 유방의 변화를 경험하고 있습니다. 하지만 대부분의 경우는 유방암이 아닙니다.

유방의 변화를 일으키는 원인은 아래와 같습니다.

- **호르몬의 변화**

호르몬의 변화로 유방이 부풀어 오르거나 부드러워지거나 덩어리가 생길 수 있습니다. 이러한 유방의 변화는 생리기간이나, 불임을 목적으로 호르몬 치료를 받거나 또는 호르몬 대체요법을 받는 동안에 일어날 수 있습니다.

- **선유섬종**

선유섬종은 부드럽고 단단한 덩어리로서 손으로 만지면 움직입니다. 선유섬종은 섬유조직과 선조직으로 이루어져 있으며 젊은 여성층에서 일반적으로 발견됩니다. 선유섬종은 암이 아니며 검진결과 선유섬종이란 판정이 나오면 대개 그대로 두어도 무방합니다. 하지만 계속해서 크기가 커지거나 형태가 달라지면 외과수술로 제거해야 할 것입니다.

- **낭종(Cysts)**

낭종은 액체로 채워진 작은 주머니들로 이루어져 있습니다. 일반적으로 35세에서 50세 사이의 여성이나 호르몬 대체요법을 받는 여성에게서 발견됩니다. 낭종은 암이 아니며 대개 그대로 두어도 무방합니다. 낭종으로 인한 통증이 느껴지거나 덩어리가 만져질 경우 미세한 주사바늘로 낭종 안의 액체를 빼내면 낭종덩어리가 사라집니다.

- **유방암**

유방암은 유방 안에 있는 비정상 세포가 견잡을 수 없이 자라면서 발생합니다. 유방암은 젊은 여성보다는 나이가 든 여성에게서 흔히 발견되는데, 이 중 74% 이상이 50세 이상 여성에게서 발견됩니다. 유방암 세포가 다른 곳으로 전이되기 전에 조기에 발견하여 치료하는 것이 중요합니다.