Medicine at the multilingual crossroads

"Translation is not a matter of words only: it is a matter of making intelligible a whole culture."

Anthony Burgess

Bengali for Pharmacists

New law requires New York pharmacies to translate medicines prescriptions into their clients' native languages

Once all of our study material has been properly filed away and the drug has been licensed, the communication challenge shifts to pharmacies. Whereas in Europe, medicines are dispensed in fully labelled packages that come with a patient information leaflet in each of our national languages, the predominant practice in the USA is dispensing from bulk. One of the implications of this practice is highlighted by recent legislation having pharmacists provide counselling to clients with limited English proficiency (LEP) in their own language.

The story reads like a recent addition to the folklore of the Wise Men of Gotham, known since the 12th century for their rather grotesque actions. In the year 2000, then US president Bill Clinton signed Executive Order 13166 aimed at improving access to services for persons with LEP. So far, so good.

Among the US cities most challenged by Executive Order 13166 is polyglot New York, where about 1 in 2 residents speaks a language other than English at home. In 2007, immigrant organisations filed a complaint with the NY State Attorney General, decrying pharmacies for not providing adequate translation services to clients with LEP [1]. As a result, the Language Access in Pharmacies Act was passed in September 2009, requiring chain pharmacies in Big Apple to offer language assistance and translated medicine labels to their customers speaking 1 of the 7 most common foreign languages spoken in the city, i.e. Spanish, Chinese–Cantonese–Mandarin, Russian, Korean, Italian, French Creole, and Bengali.

The NY Times quoted Attorney General Andrew Cuomo as saying that "The need to understand prescription information can literally be a matter of life and death." For New Yorkers who do not speak English as a first language, he continued, "this agreement will ensure they have the medical information needed to protect their health and well-being and that of their families" [2]. Yet, considering the complexity of the translation process and the multitude of target languages covered by the new legislation, Mr Cuomo's statement may have been a little too optimistic a little too soon.

Sharif from Montefiore Medical Center, New York, and Tse from Dartmouth College, New Hampshire, set out to determine how many pharmacies in the Bronx, where 44% of residents are Spanish-speaking, were able to provide Spanish-language prescription labels and to evaluate the accuracy of the translated labels [3]. Each participating pharmacy was presented with 4 different prescriptions made up for a fictitious patient and were asked to translate them the way they normally would for a client.

Of 316 pharmacies, 286 (91%) participated. Overall, 209 (73%) provided medicine labels in Spanish. To translate the labels, 86% of pharmacies used computerised translation software—with 70% of respondents using 1 of 3 major programs—, 11% used lay staff members, and 3% used a professional translator.

Sharif and Tse evaluated 76 medicine labels generated by 13 different computer programs. Overall, 32 Spanish labels (42%) included a mixture of English and Spanish and 6 labels contained misspellings or grammatical errors, resulting in an overall error rate of 50%. Phrases that were not translated because they were not present in the translation database included 'dropperfuls' or 'apply to affected areas', resulting in translations such as "Aplique to affected areas dos veces al dia for 7 days".

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"Apply to breast twice daily? Seems kind of extreme for a hangover cure. Oh well, here goes!"

Gained in translation

> While most grammatical errors will not cause any harm, some of the misspellings may. For example, one of the prescriptions read "ferrous sulfate (15 mg/0.6 mL), 0.6 mL administered **orally** twice per day; give with juice". It was translated into Spanish as "toma 0.6 mL dos veces al dia **por la poca** con jugo" and back-translated into English as "taking 0.6 mL 2 times to the day **by the little** with juice". Because the Spanish word *boca*, meaning 'mouth', was misspelled for *poca*, **orally** ended up being translated as **little**. In another instance, the phrase **once a day** became **eleven times a day** in translation.

In view of the results reported by Sharif and Tse, the current system of translating medicines prescriptions, in addition to probably incurring not insignificant extra costs, clearly has the potential to do more harm than good. The authors conclude that regulations whereby medicine labels be made available in a variety of languages should be assessed in the light of the technological capabilities of pharmacies. To this one might add that consulting language experts before embarking on any language-related project would be a good idea—they can give valuable advice and realistic input into a translation strategy that will really work.

One option that comes to mind is making available multilingual prescription forms, enabling physicians to merely fill in the dosage. Rather than using words only, such forms could make heavy use of pictograms. In view of the known limitations of machine translation, any translation software should be based on fixed standard phrases rather than on individual words, and it should be subject to strict quality control measures to avoid mistranslations from being programmed into the system in the first place: software does not replace *boca* with *poca* unless programmed to do so. Finally, because prescription information 'can literally be a matter of life and death', translation output must be checked for accuracy before being handed to the patient.

Having found major problems with the English-Spanish pair—a fairly common language combination in the USA—the authors added that they found it "worrisome to consider what the status of translation for other languages might be" [3].

To deter King John from building a castle close to the town of Gotham in England's Nottinghamshire, the residents of Gotham decided to act like fools, attempting to fish the moon out of a pond or to drown an eel. Ultimately, their ruse was successful and the King left the village voluntarily. Ironically, American writer Washington Irving, apparently seeing some similarities between the English Gothamites and his fellow New Yorkers, popularised the nickname Gotham for New York City some 200 years ago. Assuming that the 2009 Language Access in Pharmacies Act was passed with the best of intentions and not to deter non-English speakers from settling in New York, the city will have to work a little harder to effectively put the regulation into practice. In modern-day Gotham City—perhaps Batman could lend a helping hand.

Speaking of prescriptions and pictograms...

Source: public domain [6]

Ever wondered where the crossed 'R' used in prescriptions comes from? One interesting hypothesis holds that it is derived from the Eye of Horus [4, 5]. In Egyptian mythology, Horus was one of five children of Ra and Rhea, i.e., Horus, Osiris, Set, Isis, and Nephthys. Osiris succeeded Ra as king of Egypt and married his sister Isis. After their brother Set murdered Osiris, the widow Isis requested her brother Horus to destroy Set. During the battle that ensued, Horus's right eye was torn out, but was magically restored. Since that time, the stylized symbol of his eye has been a representation of health and happiness.

Source: public domain [6]

The Eye of Horus, consisting of a human eye with the cheek markings of a falcon, is depicted as consisting of 6 parts, with each part corresponding to one of the six senses, i.e., touch, taste, hearing, thought, sight, and smell. In Ancient Egypt, the Eye of Horus represented a fractional quantification system to measure parts of a whole. The entire eye measured 1 heqat, and each part of the eye made up a fraction of the heqat. This system was used to record land, grain, and prescriptions. Interestingly, however, the fractions add up to 63/64ths only.

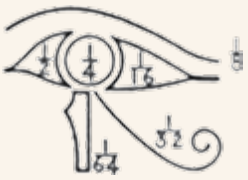

Image created by Jeff Dahl [8]

The symbol was apparently still present in the times of Tutankhamen (1341–1323 BC) [5]. In the 8th century BC, Homer described the Egyptians as having been skilled physicians, and the symbol of the Eye of Horus was later adopted by Greek physicians, who then brought it to Rome. Nero attempted to ascribe the symbol to the Roman god Jupiter and strove to establish it as a sign of the submission of physicians to the state. The Christian Church tried to Christianise the symbol, changing it into a double R—the response of Raphael, and the medieval alchemists returned to the original Greek symbol. In the Age of Reason in the early 17th century, the meaning of the 'R' was rationalized to derive from the Latin imperative of the verb *recipere*, i.e. *recipe*, meaning 'take'—a direction addressed to the pharmacist.

An alternative theory holds that the symbol originated in medieval manuscripts and is an abbreviation of the Latin *recipe*. It has been noted that this hypothesis does not explain the 'x' at the bottom of the 'Rx' symbol. According to Alan D Corre, Emeritus Professor of Hebrew Studies of the University of Wisconsin, this is not to be read as an 'x'

[9]; rather, when Jesus talked about the 'tittles' in sacred texts, he referred to the small decorations on certain letters in a manuscript. The line on the 'R', Corre says, is such a tittle, showing that the 'R' is an abbreviation.

Thus, the origin of the crossed 'R' used in English prescriptions appears to have enough explanations to suit every possible political, philosophical, or religious leaning. By the way—the German equivalent for 'Rx' is 'Rp', clearly deriving from *recipe* and leaving less room for interpretation as to its origin.

Translation resources

EDQM Standard Terms

The collection of Standard Terms compiled by the European Directorate for the Quality of Medicines & HealthCare (EDQM) covers dosage forms, routes of administration, and containers used for human and veterinary medicines [10]. It gives the equivalents of several hundred terms in 31 world languages.

The lists of Standard Terms were drawn up by the European Pharmacopoeia Commission at the request of the EU Commission for use in marketing authorisation applications, SPCs, and product labels. Online access costs €72.00. Although not all terms are available in all languages, the lists are being updated regularly and also include non-EU languages, such as Chinese. As such, they may be a good starting point for translation software developers servicing New York pharmacies...

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First non-Latin web addresses launched

According to Rod Beckstrom president of the net regulator Icann "Over half the Internet users around the world don't use a Latin-based script as their native language". His company is the first to provide a system that allows full web addresses that contain no Latin characters. Up until now websites could use some non-Latin letters, but the country codes such as .eg for Egypt had to be written in Latin script.

Egypt, Saudi Arabia and the United Arab Emirates are the first countries to have country codes written in Arabic scripts.

Egypt: مصر

Saudi Arabia: السعودية

United Arab Emirates: امارات

Web addresses in other scripts including Chinese will be coming soon. This development should avoid a split in the Internet with countries or groups developing their own exclusive non-Latin Internets.

Source: http://news.bbc.co.uk/2/hi/technology/10100108.stm

Could anyone on the planet have missed this...?

"First species on the planet to have its parent being a computer"

This is how Craig Venter described the creation of a synthetic living cell at the J Craig Venter Institute in an interview with the BBC [1]. The achievement has already been hailed as "one of the most important scientific achievements in the history of mankind". In their paper published in *Science Magazine* [2] the group reports on the design, synthesis, and assembly of the 1.08-Mbp *Mycoplasma mycoides* JCVI-syn1.0 genome starting from digitised genome sequence information and its transplantation into a *Mycoplasma capricolum* recipient cell to create new *Mycoplasma mycoides* cells. These cells are capable of continuous self-replication. One obvious use for the cells is in vaccines.

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