

# Improving the transparency of health information found on the internet through the HONcode: a comparative study

Sabine LAVERSIN<sup>a</sup>, Vincent BAUJARD<sup>b</sup>, Arnaud GAUDINAT<sup>b</sup>, Maria-Ana SIMONET<sup>b</sup>, Célia BOYER<sup>b 1</sup>,

<sup>a</sup> Haute Autorité de Santé, France

<sup>b</sup>Health On the Net Foundation, 81 bd de la Cluses 1205 Geneva, Switzerland;  
contact: [celia.boyer@healthonnet.org](mailto:celia.boyer@healthonnet.org),

**Abstract.** Objectives: This study aims to show that health websites not asking for HONcode certification (Control sample websites A) do not respect elementary ethical standards such as the HONcode. The HONcode quality and ethical standards and the certification process have been developed by the Health on the Net Foundation to improve the transparency of the health and medical information found on the Internet.

**Method:** We compared the compliance with the 8 HONcode principles, and respectively the respect of principles 1 (authority), 4 (assignment), 5 (justification) and 8 (honesty in advertising and editorial policy) by certified websites (A) and by health websites which have not requested the certification (B). The assessment of the HONcode compliance was performed by HON evaluators by the same standards for all type of sites.

**Results:** 0.6% of health websites not asking for HONcode certification does respect the eight HONcode ethical standards vs. 89% of certified websites. Regarding the principles 1, 4, 5 and 8, 1.2% of B respect these principles vs. 92% for A.

**Discussions:** The certification process led health websites to respect the ethical and quality standards such as the HONcode, and disclosing the production process of the health website.

**Keywords.** HONcode, Certification, Transparency, Trustworthiness, Quality criteria

## Introduction

Studies [1-6] showed evidence of the presence of wrong or incomplete or deceptive health information on health websites. A systematic review [7] of the literature showed that the criteria used to evaluate the quality of health related websites vary from one study to another, and that common quality criteria must be defined.

The European Commission released the proposal of a consensual answer, eEurope 2002, quality criteria to apply to the health websites [8]. In 2002, the French authorities, worrying about the quality of the health websites and their information given to the public, passed a law (*loi n°2004-810* about the health insurance) mandating the HAS to establish a certification process of health websites: « The Haute

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<sup>1</sup> Corresponding Author.

Autorité de Santé is in charge of drawing up a procedure of certification of health related websites ... ».

In order to fulfil this mission, the Haute Autorité de la Santé (HAS) identified and appointed by selection the Health On the Net Foundation (HON), for the certification of French health websites. This study was conducted by the HAS with the cooperation of HON.

This study aimed at verifying how much: I) the 8 HONcode principles (presented in the Table 1) are respected by a control sample of non-certified websites which have never asked for it (B). II) the HONcode certification led certified websites (A) to respect the HONcode principle sustainably at least for six months after obtaining the certification, thus contributing to maintaining standards of quality health websites provided by the European Commission. III) the certification contributes to the improvement of the quality of the health information given by the websites, especially by the respect of principles 1 (authority), 4 (assignment), 5 (justification) and 8 (honesty in advertising and editorial policy). These four principles provide indispensable conditions (but not enough) to the quality of the information content on the site.

We present here the results of the comparative study. The results of the longitudinal study conducted in parallel will be presented at the MED-E-TEL conference

## **1. Method and material**

### *1.1. Study design: Comparative study*

The study compares the HONcode compliance of websites that have been HONcode certified for at least six months (A) to the HONcode compliance of non-certified French health websites (B) that never asked for the certification and were taken as a control sample.

### *1.2 Sample constitution*

The group A has been constituted by selecting all health sites whose publisher was located in France and applying for certification for the first time or certified for less than three months within the period of May 1 to August 1, 2008. Excluded were health websites with the HONcode certification for more than three months.

In the absence of a database of health sites in France, Control of French health websites sample (B) has been constituted by querying search engines and databases such as: DMOZ<sup>2</sup>, official recognized organizations by the HAS, the medical society recognized by the CNOM<sup>3</sup> and Google. The use of various sources allowed the decrease of distortions in the study of non-certified control websites. B sites were categorized by the type of the publisher and were then randomized. The sites from the both two groups A and B have been classified and paired according to the type of the publisher type to allow the building of a comparable population of sites and samples.

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<sup>2</sup> DMOZ: <http://www.aef-dmoz.org/>

<sup>3</sup> CNOM: <http://www.conseil-national.medecin.fr/index.php?url=lien/index.php&open=2>

## 1.2. Health websites evaluation

All the websites included in the study were evaluated by two evaluators from the HON Foundation in a standardised way according to the HONcode [9-10]. The sites were not anonymised.

For the evaluation, principles 2 and 4 are divided in three and two sub-parts respectively, leading to a total of 11 observations.

For each website, the respect or non-respect of each HONcode principle was scored 0 (in conformity) or 1 (in nonconformity) respectively. A website is in conformity with the HONcode when the total of its scores is equal to 0. A second analysis was made to observe the website conformity to HONcode principles 1, 4, 5 and 8. We selected the principles 1,4,5,8 related to the quality of health information. Principle 1 (Authority: Indicate the qualifications of the authors) requires that information be signed by its author and that his qualification is indicated. The reader can appreciate the match between the qualifications of the author and the nature of the information he provides. Principle 4 (Assignment) requires that the information is dated thereby appreciate its freshness and the sources of information are mentioned. The identification of sources of information could be used to verify the consistency between information and the source from which it originates and the quality and relevance of the latter. Principle 5 (Justification: Justify any statement on the benefits or risk of products or treatments) requests the author to provide evidence supporting his claims, including by providing references that may substantiate this level of evidence. Information must be provided in an objective and balanced way. Principle 8 (Honesty in advertising and editorial policy) explicitly requires the separation of what is advertising and what is a health information allowing the reader to unambiguously identify the latter.

A website is declared in conformity to those four principles when the total of his scores is equal to 0.

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| <ol style="list-style-type: none"><li><b>1. Authoritative:</b> indicate the qualifications of the authors</li><li><b>2. Complementarity:</b> information should support, not replace, the doctor-patient relationship, the mission and the audience are explicated.</li><li><b>3. Privacy:</b> Respect the privacy and confidentiality of personal data submitted to the site by the visitor</li><li><b>4. Attribution:</b> Cite the source(s) of published information, date and medical and health pages</li><li><b>5. Justifiability:</b> Site must back up claims relating to benefits and performance</li><li><b>6. Transparency:</b> Accessible presentation, accurate email contact</li><li><b>7. Financial disclosure:</b> Identify funding sources</li><li><b>8. Advertising policy:</b> Clearly distinguish advertising from editorial content</li></ol> |
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**Table 1.** Presentation of the HONcode principle (summarized)

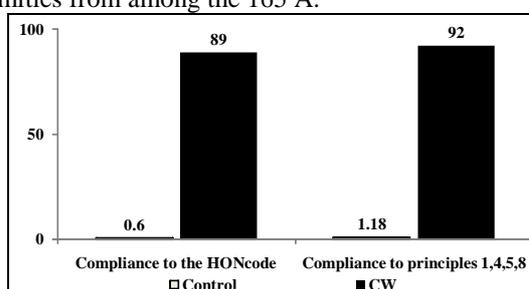
### 1.1. Statistical analysis

The observed percentages of the websites consistent with the eight HONcode principles, and of those consistent with principles 1, 4, 5 and 8, were calculated and compared by a Mac Nemar  $\chi^2$  test at a 5% threshold. The exact confidence intervals (CI) were calculated.

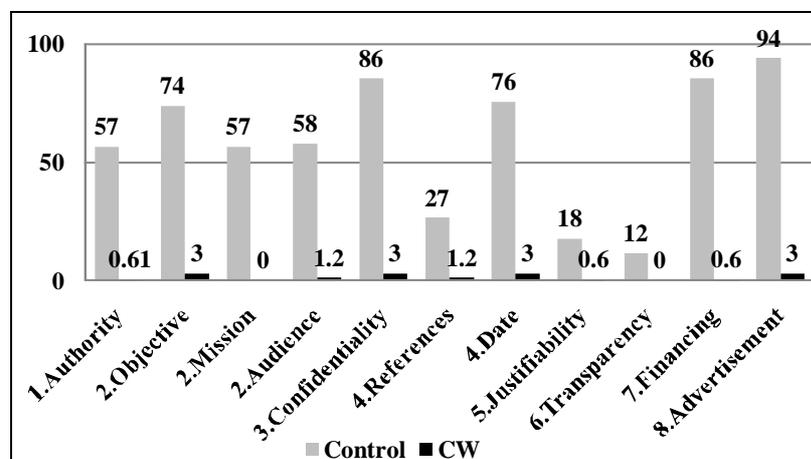
## 2. Results

165 certified websites (A) observed at least six months after certification and 165 non-certified websites (B) were compared. From among the A websites, 89% (147 sites) were in conformity with the HONcode (CI at 95% : 83 - 93), versus 0.6% (1 site) (CI at 95% : 0 - 3.3) from among the B sample ( $p < 10^{-9}$ ) (Figure 1).

Figure 2 represents the percentage of the websites in accordance with the observed nonconformities from among A and B groups. A statistical significance was searched in a sub-groups analysis. 1087 nonconformities were observed among the B websites (making an average of 6 non-respected HONcode principles per control website), versus 27 nonconformities from among the 165 A.



**Figure 1.** A websites (CW) and Control websites B according to their conformity to the HONcode and to the 1<sup>th</sup>, 4<sup>th</sup>, 5<sup>th</sup> and 8<sup>th</sup> HONcode Principles.



**Figure 2.** Percentage observed among the A (control) and B (CW)

The percentage of websites in conformity with the HONcode principle 1, 4, 5 and 8 from among the A was 92% (152 sites) (CI at 95% : 87 - 96), versus 1.2% (2 sites) (CI at 95% : 0.1 - 4.2) from the Control sample websites (B) ( $p < 10^{-9}$ ) (figure 1).

## 3. Discussion

Outside of a certification process, the respect of the HONcode principles by health websites appears to be extremely low. In our study, only 0.6% of control websites

respect all the HONcode principles against 89% for certified websites, with a p-value highly significant ( $p < 10^{-9}$ ). This finding is reinforced by the results of previous studies: three studies [11-13] that assessed 33, 19 and 182 websites respectively found no websites that respect spontaneously all HONcode principles. In another study [14], covering 90 websites, only 15% of the websites (14 websites) were in compliance with all the HONcode principles. Certification appears to be an effective means of enforcing the HONcode principles in a sustainable way since 89% (147 websites) of the certified websites were always compliant at least six months after obtaining the certification. This study has some limitations. The interobserver agreement assessor has not been evaluated and the site evaluated was not blinded. The evaluation of all health sites included in the study was performed by two experienced evaluators of the HON. Other factors may influence the results such as the number of new pages or modified pages. Indeed, a site will remain compliant if any new page has been published and if any pages already published were modified. The pairing of sites (each site as its own control) should help to minimize this potential bias.

This study shows that most of not certified health websites do not respect the quality criteria such as those proposed by the eEurope 2002. It shows that certification leads websites to respect HONcode criteria, thus improving the transparency of the production processes of sites and information they propose. This study cannot conclude that the information disseminated by the certified sites are more accurate than those issued by non-certified sites, however, the respect of the HONcode principles 1, 4, 5 and 8 by the certified sites helps to improve the transparency of information disseminated. Further studies are needed to assess this point.

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