An open, trustworthy and multilingual search engine for medical practitioners

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Clinicians search for information frequently, but studies show that

- Physicians have an unmet information need for **2 of every 3 patients** seen and **41% of the questions** they pursued

- Exhaustive information searching often takes a long time and (30+ minutes)
How diagnosis aid is perceived

DOES IT HURT WHEN I PRESS HERE?
10 Million €
12 institutes, 9 countries
September 2010 – August 2014
Large-scale questionnaires and interviews were conducted with medical professionals and the general population.
Distribution of countries

- Austria: 43%
- Switzerland: 31%
- United Kingdom: 8%
- Germany: 4%
- France: 3%
- Other**: 10%

* Based on a sample where N= 558
Age distribution

* Based on a sample where N = 434
Internet experience

* Based on a sample where N=559

Question: "How long have you been using the Internet?"
How often do you access the Internet during a consultation?

* Based on a sample where N = 558
When do you use the Internet most for professional purposes?

- When I need an immediate answer: 43%
- To fulfill my educational needs: 39%
- When I require a non-immediate answer: 18%

*Based on a sample where N = 500*
What kind of medical information do you look for as part of your daily practice?

<table>
<thead>
<tr>
<th>Information Type</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug information</td>
<td>2</td>
<td>9</td>
<td>29</td>
<td>50</td>
<td>11</td>
</tr>
<tr>
<td>Clinical trial information</td>
<td>5</td>
<td>13</td>
<td>27</td>
<td>39</td>
<td>17</td>
</tr>
<tr>
<td>Medical education/conferences</td>
<td>2</td>
<td>15</td>
<td>35</td>
<td>40</td>
<td>7</td>
</tr>
<tr>
<td>Treatment specific information</td>
<td>4</td>
<td>13</td>
<td>40</td>
<td>39</td>
<td>4</td>
</tr>
<tr>
<td>Disease descriptions</td>
<td>4</td>
<td>16</td>
<td>48</td>
<td>30</td>
<td>1</td>
</tr>
<tr>
<td>Diagnostic Aid</td>
<td>9</td>
<td>22</td>
<td>48</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Abbreviations</td>
<td>14</td>
<td>33</td>
<td>37</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>Cause and risk factors</td>
<td>7</td>
<td>31</td>
<td>41</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Information/leaflets for patients</td>
<td>17</td>
<td>43</td>
<td>26</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>Prevention</td>
<td>15</td>
<td>40</td>
<td>33</td>
<td>10</td>
<td>2</td>
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<tr>
<td>Medical equipment</td>
<td>26</td>
<td>42</td>
<td>29</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Job/career opportunities</td>
<td>50</td>
<td>29</td>
<td>15</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

Percent
How often does obtaining online information lead to the following actions?

- Conduct further research using other resources: 10% Never, 18% Rarely, 45% Sometimes, 24% Often, 4% Always
- Request more information about a product or medication: 14% Never, 33% Rarely, 35% Sometimes, 15% Often, 2% Always
- Modify a patient’s treatment or therapy: 13% Never, 34% Rarely, 46% Sometimes, 7% Often, 1% Always
- Ask a colleague for his/her opinion: 18% Never, 30% Rarely, 39% Sometimes, 12% Often, 1% Always
- Print out patient information/or recommend a website to the patient: 21% Never, 29% Rarely, 35% Sometimes, 14% Often, 1% Always
- Recommend further tests based on symptoms: 19% Never, 32% Rarely, 38% Sometimes, 10% Often, 1% Always
- Change a patient’s medication: 17% Never, 37% Rarely, 40% Sometimes, 7% Often, 1% Always
- Recommend to a patient a behaviour change of habits: 22% Never, 33% Rarely, 34% Sometimes, 9% Often, 1% Always
### Use of online resources

* Question asked: "How often do you use the following types of online resources to find online medical information?"

<table>
<thead>
<tr>
<th>Resource</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Search Engine</td>
<td>15</td>
<td>15</td>
<td>49</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Medical research databases</td>
<td>8</td>
<td>12</td>
<td>21</td>
<td>35</td>
<td>24</td>
</tr>
<tr>
<td>Wikipedia</td>
<td>8</td>
<td>21</td>
<td>31</td>
<td>33</td>
<td>7</td>
</tr>
<tr>
<td>Society websites</td>
<td>7</td>
<td>23</td>
<td>32</td>
<td>32</td>
<td>5</td>
</tr>
<tr>
<td>Hospital or University websites</td>
<td>9</td>
<td>25</td>
<td>37</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>Targeted/Area specialized websites</td>
<td>11</td>
<td>22</td>
<td>36</td>
<td>27</td>
<td>4</td>
</tr>
<tr>
<td>General health websites</td>
<td>17</td>
<td>31</td>
<td>31</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Websites suggested by a colleague</td>
<td>15</td>
<td>36</td>
<td>38</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Point-of-Care databases</td>
<td>27</td>
<td>36</td>
<td>23</td>
<td>17</td>
<td>7</td>
</tr>
<tr>
<td>Pharmaceutical company websites</td>
<td>27</td>
<td>43</td>
<td>16</td>
<td>22</td>
<td>7</td>
</tr>
<tr>
<td>Physician network communities</td>
<td>55</td>
<td>43</td>
<td>24</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Medical forums/Blogs</td>
<td>57</td>
<td>22</td>
<td>27</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Specialized medical search tool</td>
<td>61</td>
<td>22</td>
<td>11</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

Percent of respondents by frequency of use.
How much time can you / are you willing to spend on trying to find the answer to an important complex clinical question?

* Based on a sample where N= 460
How much time can subgroups devote to complex questions?
What do you usually first type into the search bar when you want to find out more about a medical problem?

- The diagnosis: 73%
- The symptom: 20%
- Other: 7%

* Based on a sample where N=449
Which advanced search options do you mainly use?

- Date range: 45%
- Language: 39%
- Country: 17%
- Document format (pdf, doc, ppt): 13%
- Other: 5%
- I do not use advanced search options: 30%

* Based on a sample where N=457 and multiple (N=683) were allowed
Barriers to finding medical information online

- Time consuming to find relevant information: 55%
- Search results are too general: 33%
- Absence of good quality filter/rating: 30%
- Questionable trustworthiness: 28%
- Distracting ads: 16%
- Lack of usability for mobile devices and smartphones: 12%
- Language barrier: 5%
- Search results are too specific: 5%

* Based on a sample where N=434 and multiple responses (N=1160) were allowed to the question “What difficulties do you face when searching for medical information online?”
Would you prefer…?

- To have ads in order to keep a search service free: 63%
- To donate and avoid ads placement: 13%
- To a pay fee-for-service to avoid ads placement: 6%

*Based on a sample where N = 418*
- Makes relevant information easy to find (of course)
  Especially: drugs, disease descriptions, clinical trials
- Trustworthy and reliable
- Lets professionals share opinions and affirmation
- Openly available
- Able to rank by relevance or recency
Structured medical data and ontologies in RDF/OWL format (‘linked data‘) are unified with unstructured text data.
Acknowledgements

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http://khresmoi.eu
Additional slides...
Main specialization

- **Internal Medicine**: 23%
- **General Practice**: 16%
- **Neurology/Psychiatry**: 8%
- **Urology**: 6%
- **Child and Adolescent Medicine**: 5%
- **Anesthesiology and Critical Care Medicine**: 5%
- **Obstetrics and Gynecology**: 4%
- **Radiology**: 4%
- **Dental Medicine**: 2%
- **Other**: 15%
- **I am a physician in training**: 12%

*Based on a sample where N=431*
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CIR

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Atos Origin
WORLDWIDE IT PARTNER

Map of Europe showing blue countries and partnerships.