University Hospitals Coventry and Warwickshire NHS Trust

A Programmable Search: A solution to finding guidelines and patient information?

Welcome

hello my name is…

Dr Gavin Moore
CEBIS Specialist

Welcome

hello my name is…

Andrew Doyle
Library Operations Manager

About UHCW

- Regional centre - Major Trauma Centre
- Specialists for Cardiac, Neuro, Transplant
- National expertise in miscarriage
- First Covid vaccination
- Teaching hospital with Warwick Medical School and Coventry University
- £771 million operating expenditure (PFI)
- 1,230 beds
- 10,000+ employees
- Services delivered across the West Midlands region

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Session Outline

- The problem

- How a programmable search can solve this problem

- Setup and testing the search

- Review of the process

- Caveat - this is from a librarian perspective

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The Problem

The Problem

Evidence

Guidelines and Patient Information Leaflets

How do we find it?

Clinical Guidelines

"NICE clinical guidelines are <mark>recommendations on how healthcare and other professionals should care for people with specific conditions</mark>. The recommendations are based on the best available evidence. Clinical guidelines are also important for health service managers and those who commission NHS services." NICE, 2022

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Patient Information Leaflets (PILs)

"Shared decision making is a collaborative process that involves a person and their healthcare professional working together to reach a joint decision about care. […]

It means making sure the person understands the risks, benefits and possible consequences of different options through discussion and information sharing.

This joint process empowers people to make decisions about the care that is right for them at that time (with the options of choosing to have no treatment or not changing what they are currently doing always included)."

Shared decision making NICE guideline [NG197], Published: 17 June 2021

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Publication of Guidelines and PILs

Formal publication

- Guidelines, consensus statements in journals

Informal publication

- Reports published on websites

  – National bodies

  – Professional societies

  – Charities

  – NHS Trusts

Banerjee et al. BMC Nephrology   (2022) 23:9
https://doi.org/10.1186/s12882-021-02587-5

BMC Nephrology

THE RENAL
ASSOCIATION
founded 1950

GUIDELINES   **Open Access**

Check for
updates

Management of hypertension and renin-
angiotensin-aldosterone system blockade
in adults with diabetic kidney disease:
Association of British Clinical Diabetologists
and the Renal Association UK guideline update
2021

D. Banerjee[1], P. Winocour[2], T. A. Chowdhury[3], P. De[4], M. Wahba[5], R. Montero[6], D. Fogarty[7], A. H. Frankel[8], J. Karalliedde[9], P. B. Mark[10], D. C. Patel[11], A. Pokrajac[12], A. Sharif[13], S. Zac-Varghese[2], S. Bain[14], I. Dasgupta[13] and On behalf of the Association of British Clinical Diabetologists and The Renal Association

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Searching for Guidelines and PILs

NICE Evidence Search

- Key source for healthcare guidelines and policies
- Defunct in March 2022

Trip Medical Database

- General database
- Ranks evidence
- Not a replacement for NICE Evidence Search

National Grey Literature Collection

- Content is general

Google Search

site:.nhs.uk
site:.org.uk
filetype:pdf
after:2012-01-01

Qualifying keywords: guideline, consensus statement, patient information, patient leaflet etc.

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The Solution

Google Programmable Search

"Programmable Search Engine enables you to <mark>create a search engine for your website, your blog, or a collection of websites.</mark> You can configure your engine to search both web pages and images. You can fine-tune the ranking, add your own promotions and customize the look and feel of the search results. You can monetize the search by connecting your engine to your Google AdSense account." Google, 2022

https://developers.google.com/custom-search

"<mark>Topical search engine</mark> is an engine that focuses on a particular topic. It covers a part of the whole Web rather than a particular website - this is possible because Programmable Search Engine allows you to include multiple websites in the same engine." Google, 2022

https://developers.google.com/custom-search/docs/topical

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Features

Allows the focusing of the search to specific URL patterns

- Entire domain e.g. *.mysite.com/*

- Entire site e.g. www.mysite.com/*

- Parts of a site: www.mysite.com/*dogs

- Single pages: www.mysite.com/mypage.html

- Manual crawling and indexing - tags

Adding search terms and operators

- Query additions to all searches

- Refinements (search tabs) adding select keywords or other operators (e.g. file type) and limiting to select tags

- Creating synonyms, extra query terms, keywords

Image search

Customisable results display

Customisation using the API

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Usability

Control panel

- Intuitive interface with ample guidance
- Enable bespoke development and adaptation by non-tech audience

Audience familiarity

- Can alter the look of how results are displayed

Uses Google search engine

- Relevance

Other options that were excluded:

- Bing Custom Search
  - Less familiarity
  - Less reliable results?
- Build our own
  - Costly
  - Time intensive
  - Specialist knowledge required

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Setup & Testing

Stage 1: Identifying the curated list

Based on NICE?

- Manual
- Automated

Problems

- Duplication
- Dead links
- No categorisation?
- No curation policy?

Establish clear purpose

- Guidelines and PILs
- UK based
- Authoritative sources

Clear reason for inclusion/exclusion

- UK Charities – Association of Medical Research Charities
- UK Professional Bodies
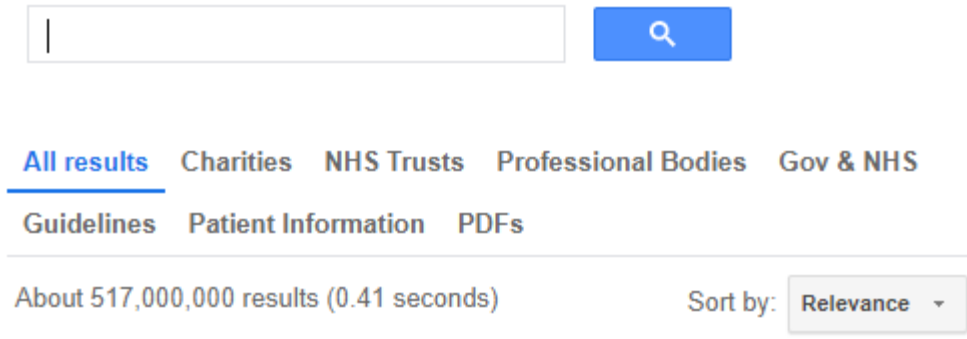- UK Hospital Trusts
- UK GOV and National Bodies

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Stage 2: Uploading the sites

1. Database in Excel
2. Convert to Word and format URLs
3. Decide what type or URL is used
   – Domain used as broadest
4. Bulk upload
5. Categorising URLs and tagging
   – Charity
   – Professional Body
   – NHS Trust
   – Gov/NHS
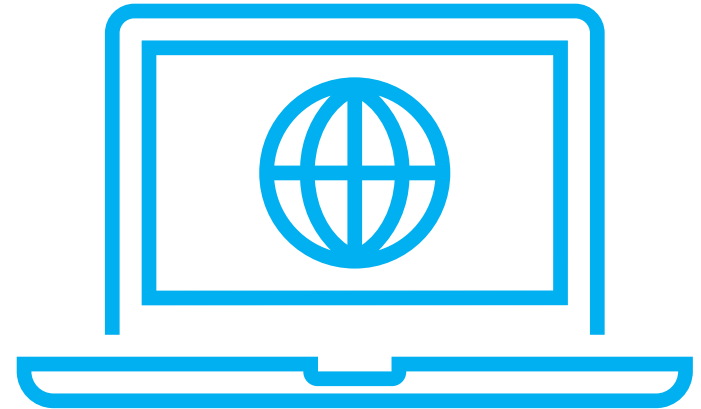
Stage 3: Adding refinements

By tag

- Charities

- Professional Bodies

- NHS Trusts

- Government & NHS

Guidelines

- Add guideline OR guidance OR "consensus statement" etc.

Patient Information

- Add "patient information" OR "patient leaflet" etc. to the search

PDFs

- Add format:.pdf

| | 🔍 |

All results   Charities   NHS Trusts   Professional Bodies   Gov & NHS

Guidelines   Patient Information   PDFs

About 517,000,000 results (0.41 seconds)   Sort by: Relevance ▾

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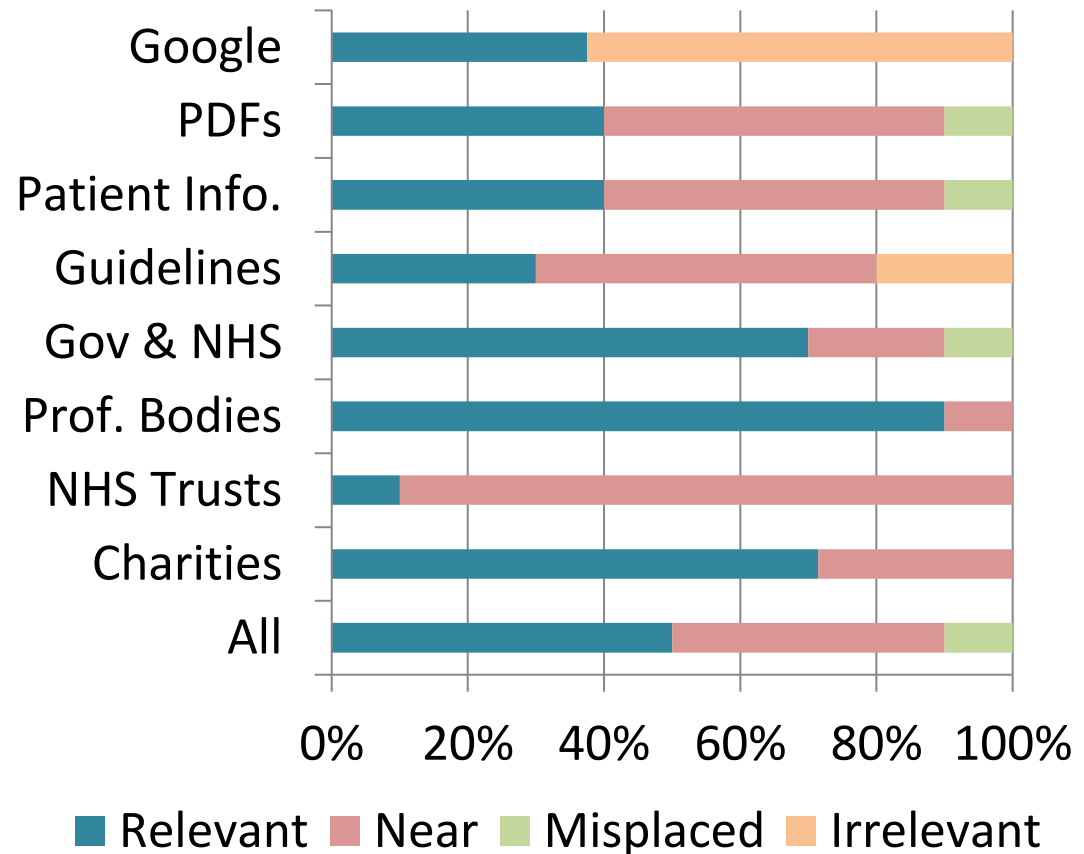**Coventry and Warwickshire**
NHS Trust

Stage 4: Precision Testing

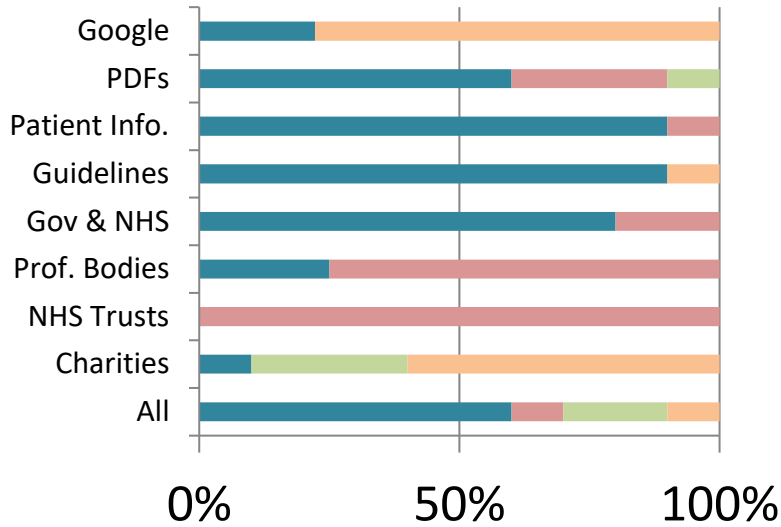Precision testing shows how close a match each result is on the first page of results.

- Does the search bring back meaningful results?

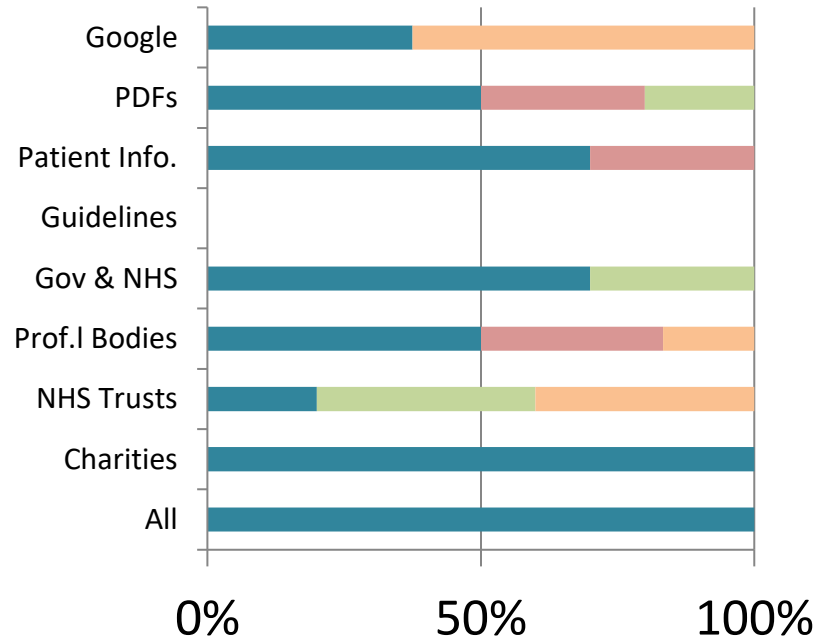Caveat - Not all pages had same number of results
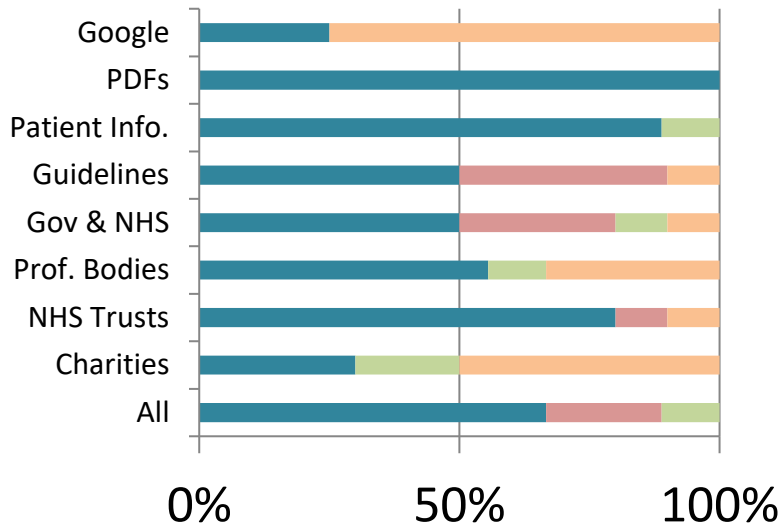
breast feeding

A horizontal stacked bar chart titled "breast feeding" showing categories: Google, PDFs, Patient Info., Guidelines, Gov & NHS, Prof. Bodies, NHS Trusts, Charities, All. X-axis from 0% to 100%. Legend: Relevant, Near, Misplaced, Irrelevant.

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asthma

radiotherapy lung cancer

cataract surgery

Relevant   Near   Misplaced   Irrelevant

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Stage 4: Relevance Testing

Where the first relevant result appears in the search results

- Identifies how far users would need to scroll
- Usability

Findings

- Better results in comparison to Google
- Much better for guidelines
- Google good for patient information – mostly NHS Choices

"When a user enters a query, our machines search the index for matching pages and return the results we believe are the highest quality and most relevant to the user. <mark>Relevancy is determined by hundreds of factors, which could include information such as the user's location, language, and device</mark> (desktop or phone)."

Google. In-depth guide to how Google Search works. 2022
https://developers.google.com/search/docs/fundamentals/how-search-works#:~:text=When%20a%20user%20enters%20a,device%20(desktop%20or%20phone).

Search terms *(searched as written)*	All Results		Charities		NHS Trusts		Prof. Bodies		Gov. & NHS		Guidelines		Patient Info.		PDFs		Google	
	PI	G	PI	G	PI	G	PI	G	PI	G	PI	G	PI	G	PI	G	PI	G
asthma	1	4	2	0	1	0	4	2	1	2	16	1	1	82	2	4	2	66
copd	1	2	1	0	8	13	4	0	1	2	11	12	1	53	5	2	1	33
heart failure	1	5	1	0	10	0	1	2	1	2	0	4	1	13	5	2	1	33
diabetes	1	7	1	0	8	0	0	2	1	9	0	1	1	78	27	29	1	56
breast cancer	2	6	1	0	8	0	0	1	1	2	6	1	1	69	1	3	1	63
colonoscopy	1	4	1	0	1	0	0	1	1	4	15	1	1	30	1	38	1	100+
cataract surgery	1	19	1	0	1	0	1	4	1	32	0	1	1	0	1	0	1	100+
radiotherapy lung cancer	1	3	1	0	1	0	0	1	1	2	0	0	1	0	6	1	1	12
breast feeding	1	2	2	0	46	0	0	1	1	2	5	1	1	2	2	1	1	51

Stage 4: Real World Test

Guideline policy change at UHCW

- Gap analysis to match local guidelines to national guidelines

- CEBIS team involvement to perform searches

- Programmable search used for UK based content

- Search undertaken in short space of time

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Stage 4: Feedback

"I love the programmable search! The categories are intuitive, and I pretty much always found what I needed on the first couple of pages of results. If what I was looking for wasn't on the first two pages, it usually meant it doesn't exist. The only glitch I encountered was with the Guidelines tab. Sometimes, results from NICE pages would appear in the main list, but wouldn't pop them into the Guidelines tab."

"Another benefit in terms of the task: without the programmable search, even by limiting the google search to .nhs.uk sites, it's likely I would have had to wade through lots of patient information, which wasn't relevant for the task. By separating out the results into the relevant fields, I only had to look at the results relevant to the task."

Abby Kendrick, CEBIS Specialist, 2022

Review

What went well

- Proof of concept
  - Interest from national bodies
  - National Grey Literature Collection

- Testing has shown that the software can provide a good search tool

- Initial stages of setting up were straightforward and easy

- Planning is essential and made the process much easier

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Problems with Programmable Search

- Adding sites and tagging is fiddly, manual, and has a high risk of error

- All results will always search all websites

- The search does not have a date filter, only a sort by date option

- Advanced features less intuitive for non-technical person

- Can be turned off or altered at any point

Programmable Search

All results   Charities   NHS Trusts   Professional Bodies   Gov & NHS
Guidelines   Patient Information   PDFs

About 517,000,000 results (0.41 seconds)   Sort by: Relevance

Google Search

Q All   News   Images   Videos   Books   More

Any country ▼   Any time ▼   All results ▼

Next steps and questions

- Addition of more sites to expand the content

- Further testing on the URLs, potentially restricting some to certain pages

- Investigation into synonyms, query additions (general), extra query terms, keywords - PubMed

- User testing outside the library

- Investigate the extra customization using Programmable search element API