Nerd approaches to scientific literature

Or how to navigate complexity without losing yorself

Giovanni Spitale, MA, PhD Student @IBME, UZH
giovanni.spitale@ibme.uzh.ch

University of Zurich[UZH]
Institute of Biomedical Ethics
and History of Medicine

AIMS

University of Zurich[UZH]
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and History of Medicine

1. Discuss the issue of publications' proliferation and present new techniques to cope with it;
2. Present what is open science and how is it reshaping our work;
3. Present some clever strategies to find an appropriate journal;
4. Maybe have some fun in the meanwhile.

GENERAL NOTES

University of Zurich[UZH]

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1. Hands on imperative! The best way to learn it is to try it out;
2. Expand your skillset – you'll never know where life will bring you;
3. Challenge the status quo – even if often you'll be miserably wrong;
4. There might always be a more clever or fastest way to do it;
5. Share it if it works, and spare other the hassle to reinvent the wheel

1. Tooo much

1. Tooo much

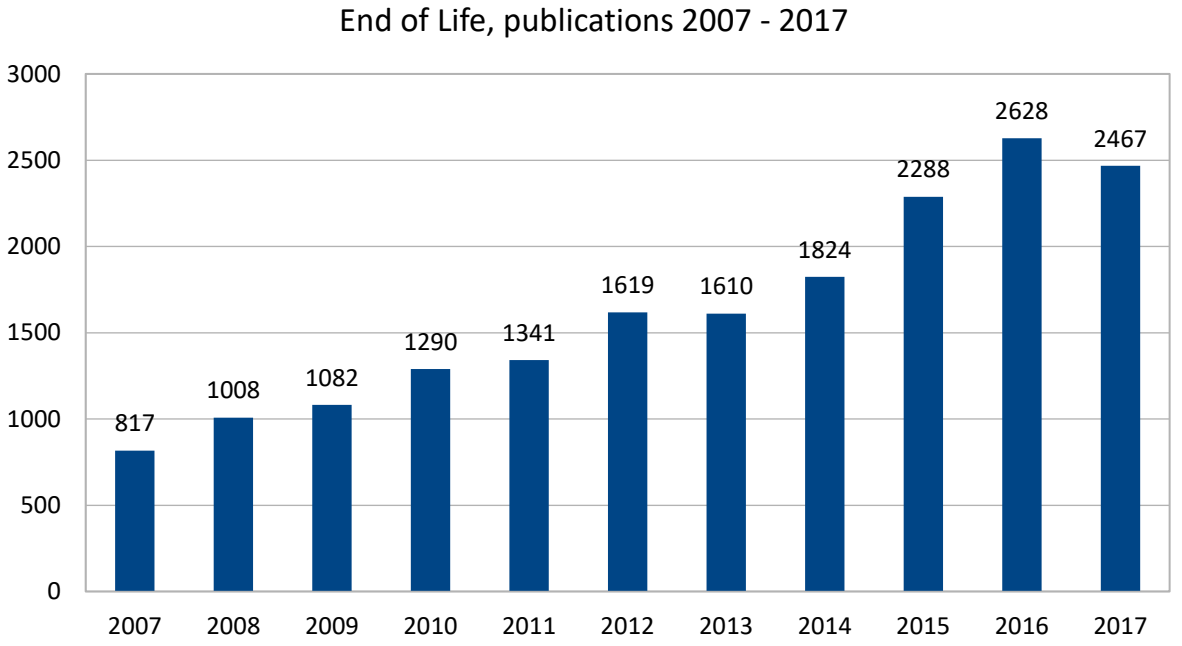
Query	Meaning	Hits
("2020/10/01"[PDAT] : "2020/10/10"[PDAT])	Every paper indexed in the last **10** days	85,140
("2020/10/01"[PDAT] : "2020/10/10"[PDAT])AND covid[Title/Abstract]	Every paper indexed in the last **10** days mentioning «covid» in title or abstract	5,823
("2020/10/01"[PDAT] : "2020/10/10"[PDAT])AND Coronaviridae[MeSH]	Every paper indexed in the last **10** days mentioning «Coronaviridae» in MeSH terms	2,983

1. Tooo much

If instead of looking to the last ten days we consider ten years, the scenario becomes overwhelming: this graph displays the number of publications found on Web of Science with the query “end of life”:

TS=("end of life") AND PY=(2007-2017)

17974 results.



Ambiguity is baaad

While in medical publications exists a (quite) unambiguous, clear and largely accepted system to index medical subject headings (MeSH), there is no such a thing for ethics. It follows that often you don't find what you are looking for simply because it uses different keywords/synonyms.

As an example...

1. Tooo much

From Davies et al., 2015:
“Despite the increased prevalence of bioethics research that seeks to use empirical data to answer normative research questions, there is no consensus as to what an appropriate methodology for this would be”.
Davies, Rachel; Ives, Jonathan; Dunn, Michael (2015): A systematic review of empirical bioethics methodologies. In: BMC medical ethics, 16, p. 15. DOI: 10.1186/s12910-015-0010-3.

Dialogical process	Combination of dialogical/consultative	Consultative process	Neither clearly dialogical nor consultative
•Inter-ethics •Response evaluation hermeneutics •Moral experience hermeneutics •Moral conversation	•Pragmatic hermeneutics •Deliberative democracy •Integrated empirical ethics	•Encounters with experience •Phenomenological hermeneutics and wide reflective equilibrium •Wide reflective equilibrium and overlapping consensus •Network model with third person moral experience •Normative empirical reflective equilibrium •…	•Interdisciplinary epoche •Ethics of public understanding •Micro-ethics •Oppositional collaboration •Complementary thesis •Distinct methodological collaboration •Phenomenological hermeneutics
4	3	22	7

What to read first?

If we want to have a comprehensive understanding of a field of medical ethics, even a quite narrow one, we cannot read everything and retain the relevant information. Moreover, as proposed by Theodore Sturgeon (and recently endorsed by Daniel Dennett) “ninety percent of everything is crap”; or, in other words, we cannot be sure a priori that every piece of literature we retrieve is worth being read.

Therefore, while approaching a new field, we have two distinct problems:

1. (Assuming for the sake of discussion Sturgeon’s law as true) how can we reduce the amount of non relevant/interesting literature in our corpus, without wasting too much time and loosing relevant information?

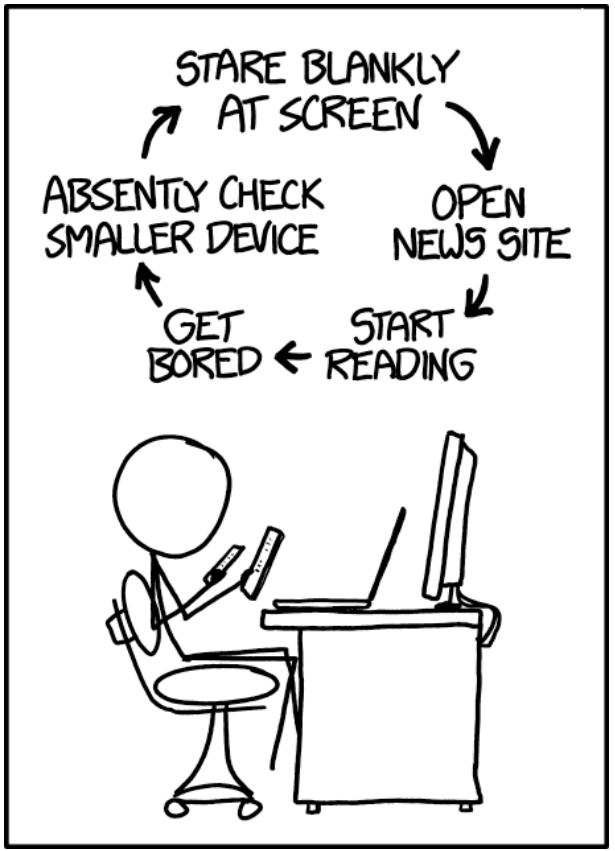
2. 10% of 5823 (covid papers) is still a lot of stuff to read. How can we approach such an amount of literature so that we have both a granular understanding of the single paper and an overall view of the main topics in the field?

1. Tooo much

Regarding problem one:

“The newer, the better” is an approach which is not viable in medical ethics. Plenty of relevant literature is old, especially if we want to understand the development of a certain practice or issue over time;
“The most cited, the better” is a flawed approach in principle: it starts a positive feedback mechanism that leads to marginalize articles that might be relevant, but for some reason didn’t receive an initial burst of quotations at their publication (“reputation echo chamber”);
Other approaches (like “follow a specific tradition/approach”) are flawed in principle: we loose a global perspective on the field (“heritage echo chamber”).
Solution: algorithmic approaches to literature retrieving → smart (and iterative) search strategies.

Regarding problem two:
“First in, first out, and read everything”: you end up with a massive amount of notes, precise on the single paper but lacking an overall picture;
“Read the abstract first, read the paper only if the abstract seems relevant”: you risk to arbitrarily miss relevant studies just because the abstract was not fancy enough.
Solution: algorithmic approaches to data → smart data manipulation.



xkcd.com/

2. One ring to find them all

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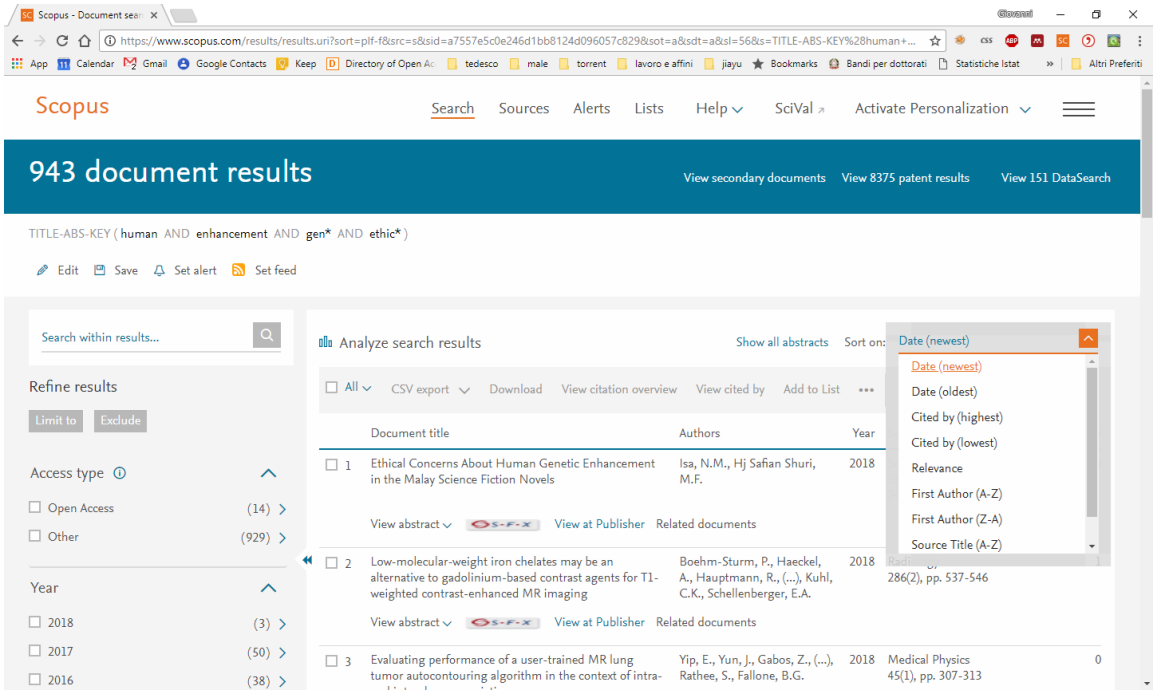
Query:
TITLE-ABS-KEY(human AND enhancement AND gen* AND ethic*)

Results:
Ordered by date, first the oldest ones

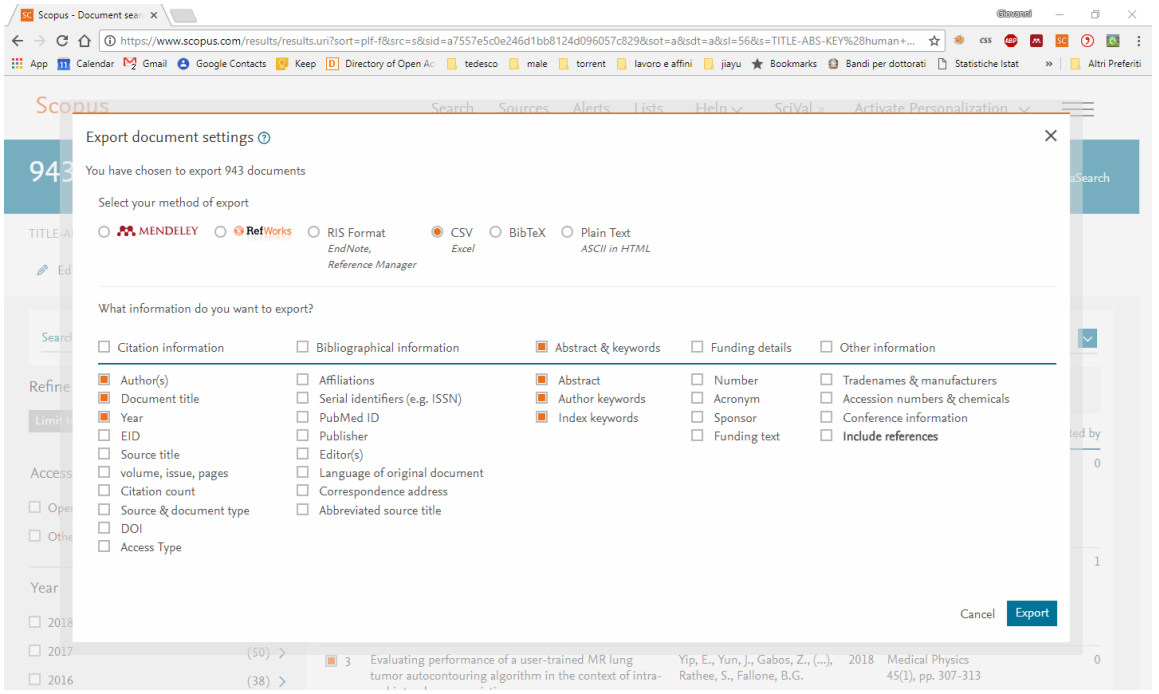


2. One ring to find them all

Export format:
CSV (comma separated values, basically a text file that can also be opened as an excel file).

Export fields:
Author, title, year, abstract and keywords (all the contentwise relevant information).

Example



2. One ring to find them all

Myers D.G., Schreiber F.B., Viel D.J.,
Effects of discussion on opinions concerning illegal behavior, 1974

https://www.scopus.com/inward/record.uri?eid=2-s2.0-0015977332&doi=10.1080%2f00224545.1974.9923074&partnerID=40&md5=b1bfbf199127b86b9223d6613134833c

In an attempt to generalize recent research on the effects of group discussion and to further elucidate mechanisms responsible for discussion-induced response change, 15 groups of institutionalized males convicted of felony and 14 groups of college males responded, before and after discussion, to three choice dilemma items and three ethical-legal dilemmas. It was predicted that (a) the enhancement of mean initial tendency observed on choice dilemma items would extend to the ethical-legal dilemmas, and (b) shift to increased risk on both types of items would occur if, and only if, subjects tended to perceive themselves as initially riskier than their average peer. On the choice dilemmas (with a Likert type response format) only small nonsignificant shifts occurred. On the ethical-legal dilemmas both the inmate and the college samples significantly increased their preference for the legally deviant action following discussion, although initially perceiving themselves to favor it less than their peers. © 1974 Taylor & Francis Group, LLC.

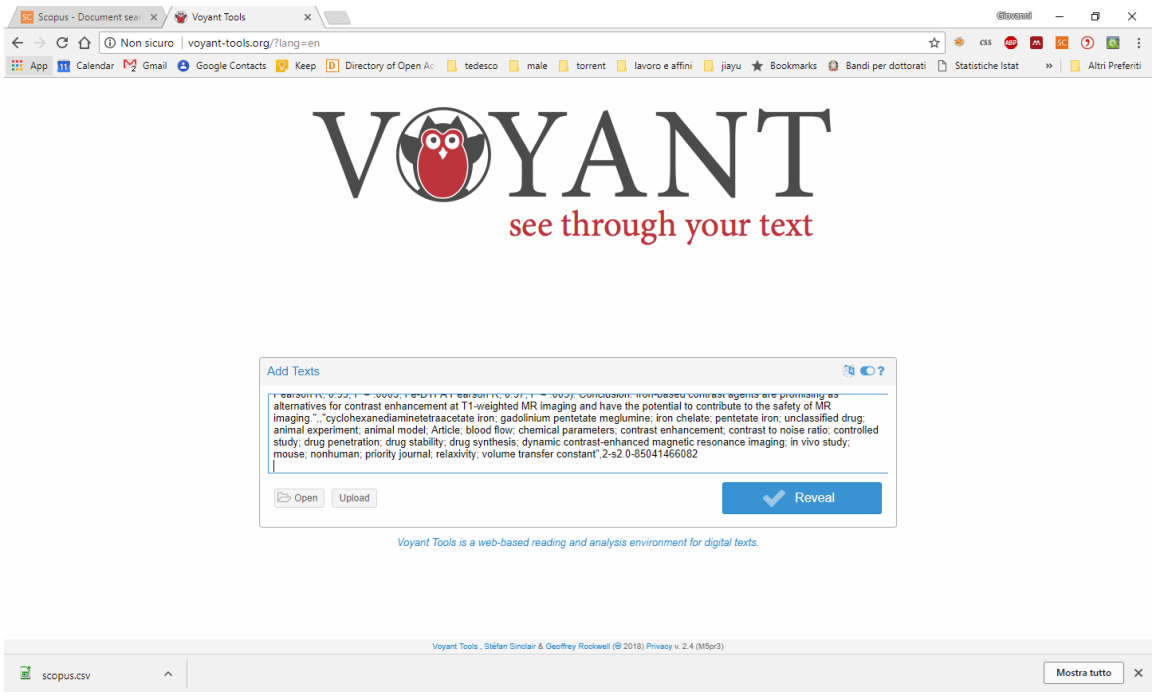
alginic acid; behavior; ethics; injury; institutionalization; major clinical study; Attitude; Criminal Psychology; Ethics; Gambling; Group Processes; Human; Male; Self Concept",2-s2.0-0015977332

2. One ring to find them all

Voyant Tools:
“A web-based text reading and analysis environment. It’s designed to make it easy for you to work with your own text or collection of texts in a variety of formats, including plain text, HTML, XML, PDF, RTF, and MS Word”.
(Sinclair, Stéfan, Geoffrey Rockwell and the Voyant Tools Team. 2012. Voyant Tools (web application). http://docs.voyant-tools.org/.

- Free and open source;
- Well documented and easy to use;
- Runs both online or locally.

Example



What’s in the data?

Below the surface of “genetic human enhancement ethics” we have a plethora of terms giving hints on what is going on in the field:

Looking to the most frequent terms, we know that the question is considered “medical”, strictly connected with social issues, one of the main subfields is reproduction, and in the last years there has been a raise of terms like “care” and “public”.
The trend of “moral” is increasing, while the trend of “ethics” is decreasing.

The trends of “gen*” (means: genetics, genetic, gene, ...) are decreasing, while the trends of “brain” and “neuro*”(means: neurology, neuroethics, neuroethic, neuroscience, ...) are increasing.

From search to research questions

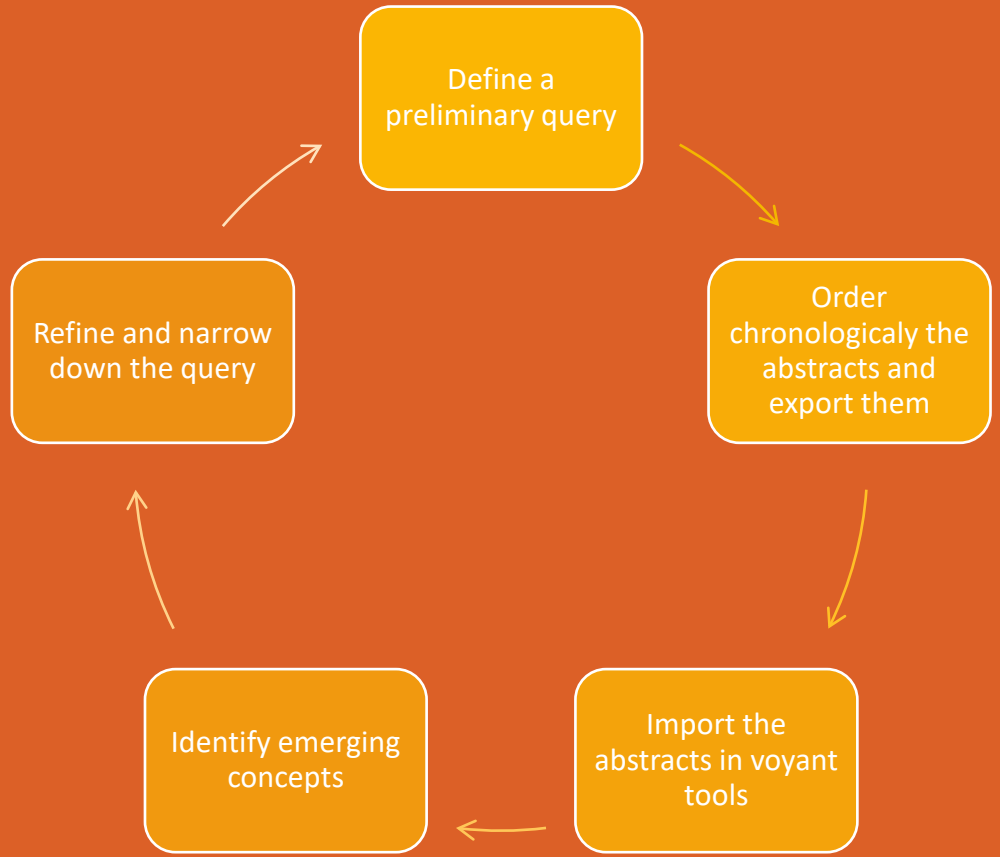
If we want to be traditional, we can start working on “Genetic human enhancement, reproduction and public policies: a care ethics perspective on the emerging social issues” → TITLE-ABS-KEY (human AND enhancement AND ethic* AND polic* AND soci* AND (reprod* OR child*)), 72 results;

If we want to surf the new wave, we can help ourselves with “Neuroenhancement: human brain improvement and moral challenges”. → TITLE-ABS-KEY(human AND enhancement AND (ethic* OR moral*) AND (brain or neuro*)), 434 results.

The process can be iterated in order to understand if our query actually captures what we are looking for and refine it...

... but still we have to retrieve and read all these papers.

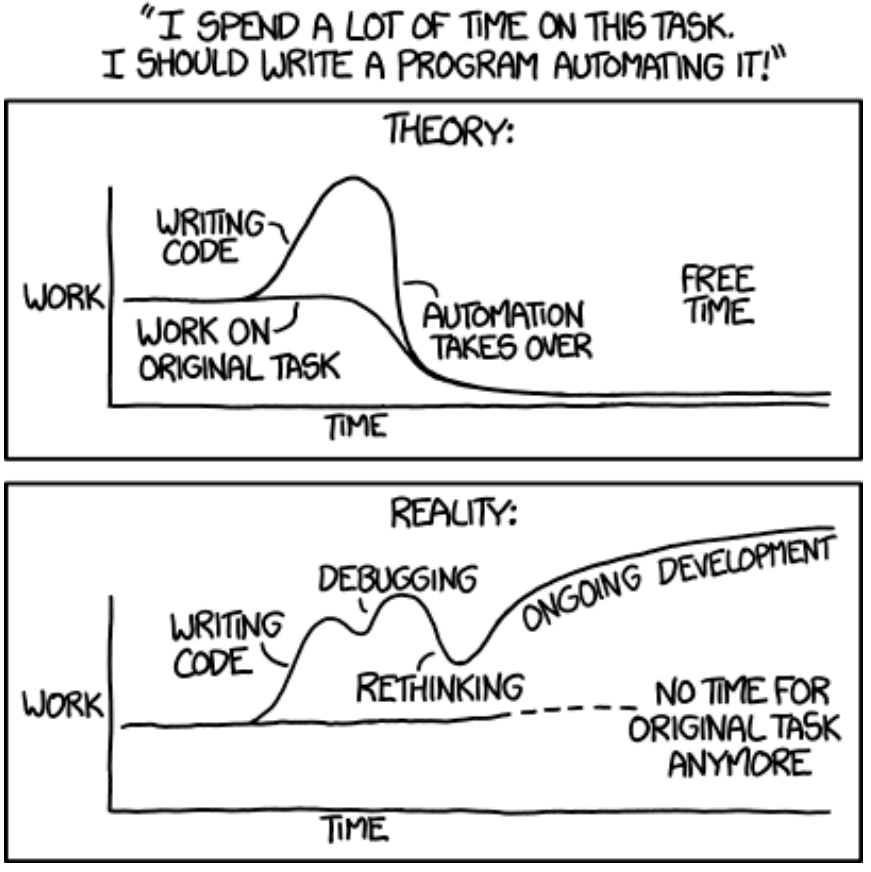
Smart Iterative Search Strategies



2. One ring to find them all

Exercise:

- Define a query that is relevant for your work
- Run it on a database of your choice
- Export the abstracts (ordered by year of publication)
- Explore their content in Voyant Tools
- Define a refined query



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3. One ring to bring them all

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Let’s assume we have identified our topic and defined a search strategy, for example:

(hematology[mh] OR hematologic diseases[mh]) AND (adolescent*[TiAb] OR teenager*[TiAb] OR "young adult"[TiAb] OR "young adults"[TiAb] OR aya[TiAb]) AND (((Share*[TiAb] OR sharing[TiAb] OR informed[TiAb] OR collaborat*[TiAb]) AND (decision*[TiAb] OR deciding[TiAb] OR choice*[TiAb] OR care*[TiAb])) OR ((patient*[TiAb]) AND (preference*[TiAb] OR view*[TiAb] OR involvement[TiAb] OR decision[TiAb] OR"decision making"[TiAb] OR attitude*[TiAb] OR participation[TiAb])))

(That is the way to tell Pubmed we’re interested into shared decision making for hematological young patients)

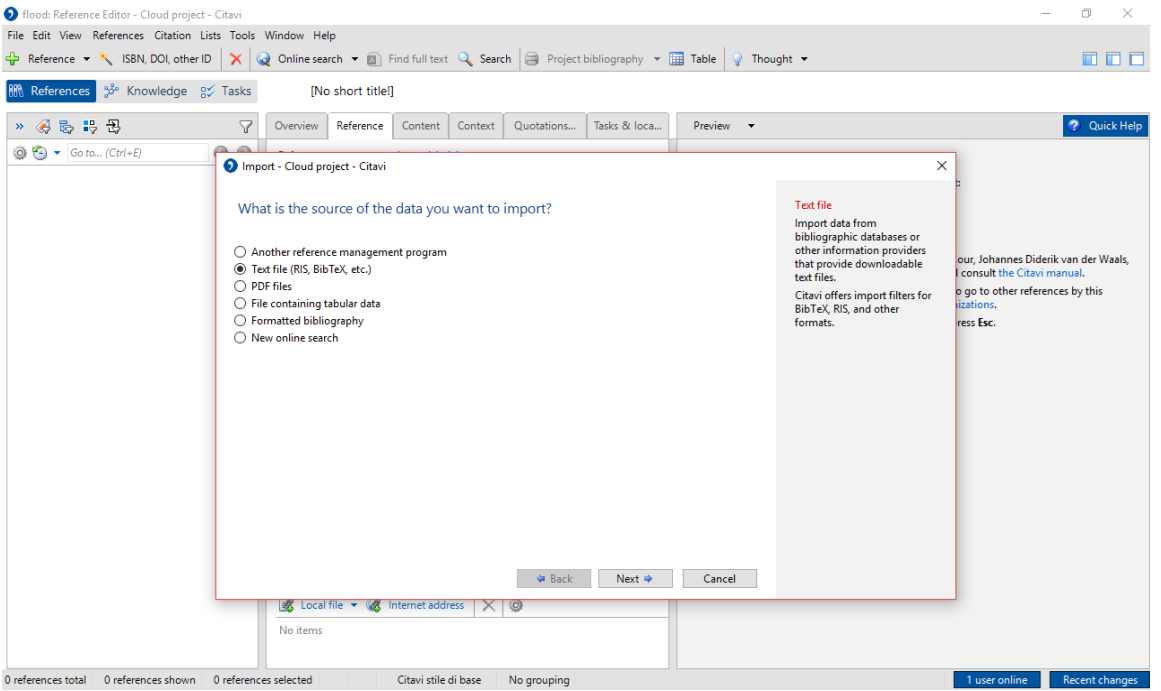
We have 192 results, and replicating the same query to Web of Science and Scopus, we reach 656.

Question: if we are extremely fast clickers (and lucky enough), how long will it take to download them?

Five hours and a half (without toilet breaks)

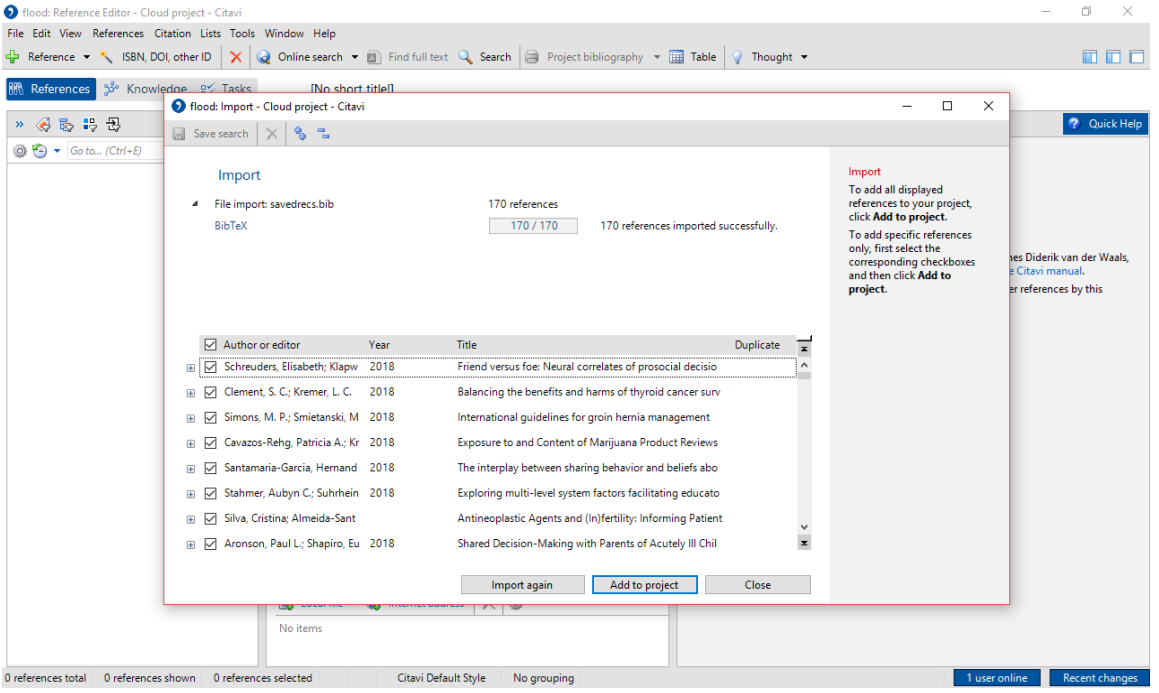
3. One ring to bring them all

Export your references from your database(s) and import the BibTeX file(s) in Citavi (or any other reference management software)



3. One ring to bring them all

Add the imported references to your project (and then perform an automatic duplicate check).

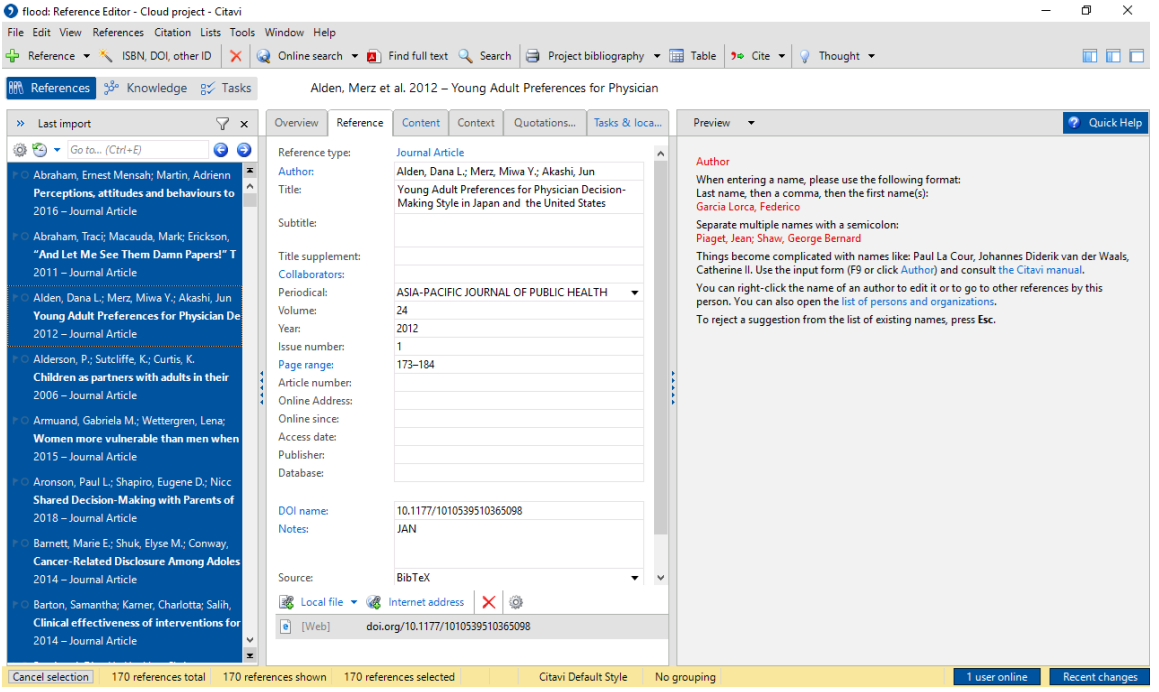


3. One ring to bring them all

Select all your references and click “find full text”: the program will download (almost) every article that is available through University’s subscriptions.

In the meanwhile, you can have a coffee ;)

I used Citavi for these examples, keep in mind that Zotero is FOSS and works just as well.

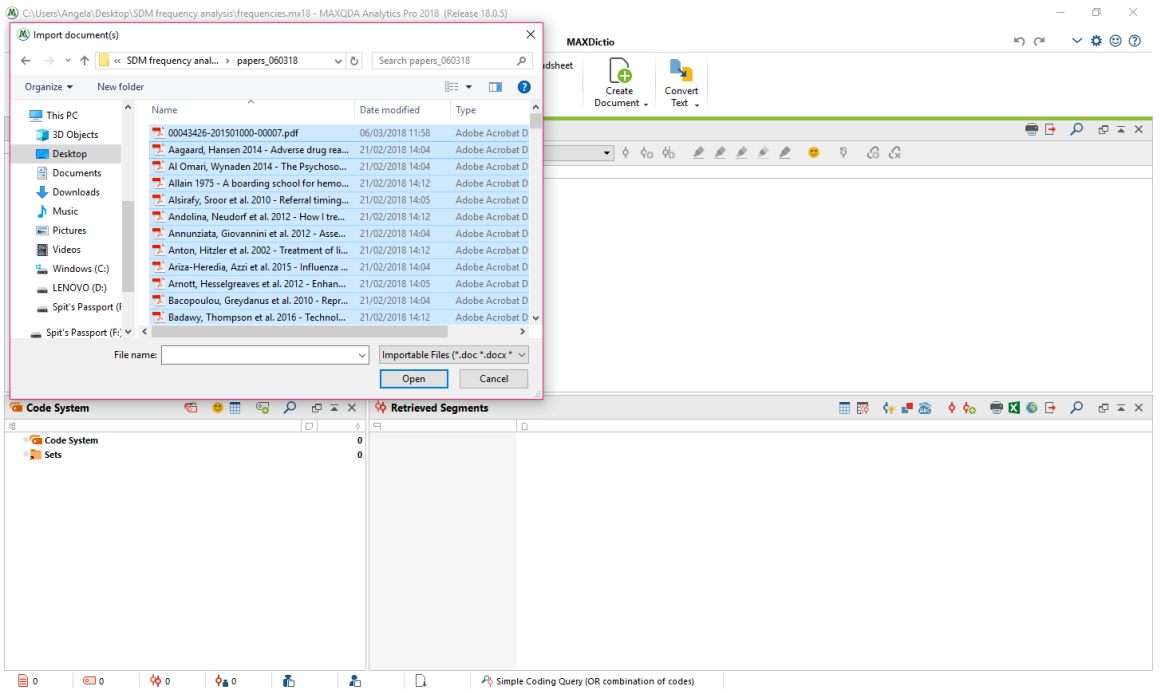


4. One ring to ‘read’ them all

(yup this is made up)

4. One ring to ‘read’ them all

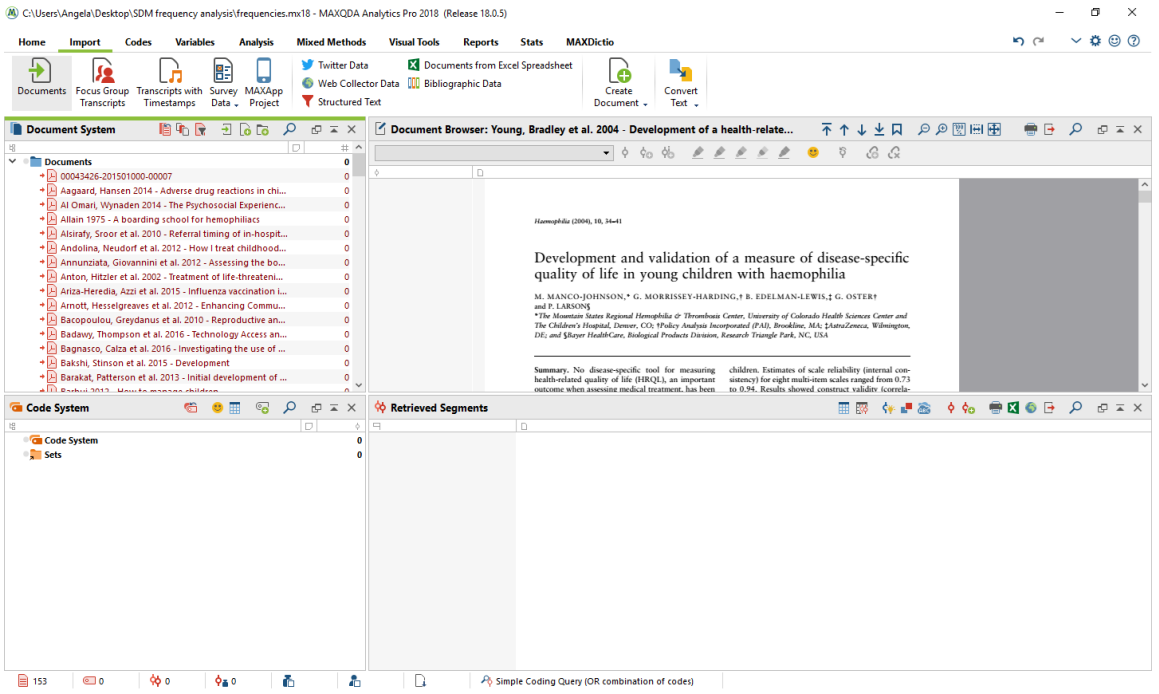
Import all the pdfs in MaxQDA Analytics pro.



4. One ring to ‘read’ them all

Activate them clicking on the gray dot close to the main folder.

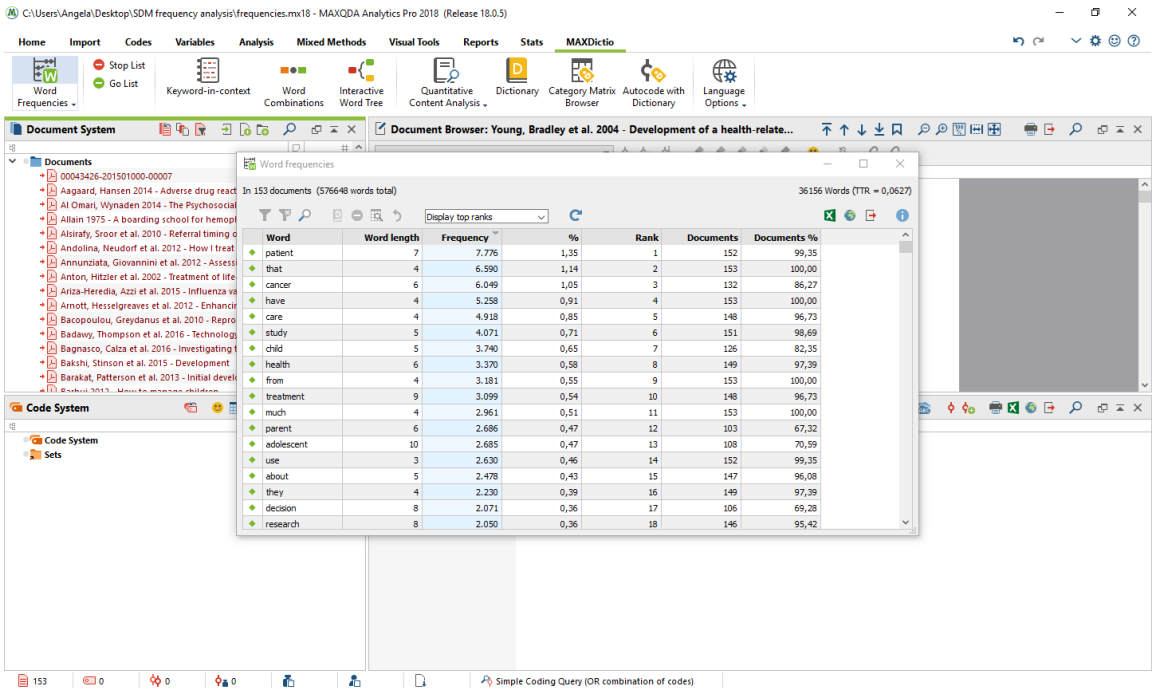
NB: the program analyses only the active documents, so all these techniques are applicable both to the entire corpus, to a single paper, and evety subset in between (e.g. only papers published in 2020)



4. One ring to ‘read’ them all

Word frequency analysis: as a first passage, as we have done with Voyant Tools, we can see the frequency of single words.

In the same way, we can evaluate the frequency of groups of words. The results can be global or grouped per paper.



4. One ring to ‘read’ them all

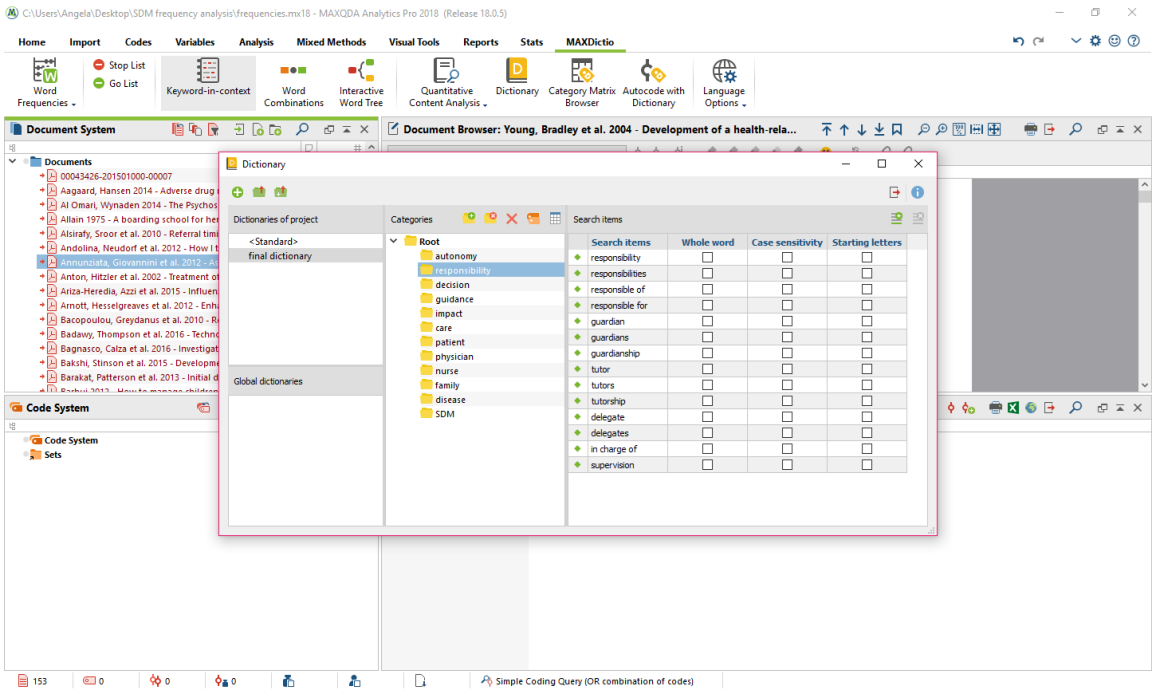
For example, now we know that 81 papers (52,94%) mention “quality of life”, that was not included in the query. This passage is useful to have an overall view on the corpus and to define further exploration strategies.

Word combination	Frequency	%	Rank	Documents	Documents %
sickle cell disease	403	0,17	1	33	21,57
quality of life	393	0,16	2	81	52,94
end of life	225	0,09	3	39	25,49
in decision make	197	0,08	4	27	17,65
of pediatric oncology	172	0,07	5	33	21,57
to participate in	161	0,07	6	53	34,64
much likely to	149	0,06	7	62	40,52
pediatr blood cancer	131	0,05	8	30	19,61
parent of child	130	0,05	9	34	22,22
health care provider	120	0,05	10	35	22,88

4. One ring to ‘read’ them all

Dictionaries: in this case, we are interested in understanding what the literature says about certain topics relevant for the research question, namely autonomy, responsibility, decision, guidance, impact, care, patient, physician, nurse, family, disease and shared decision making.

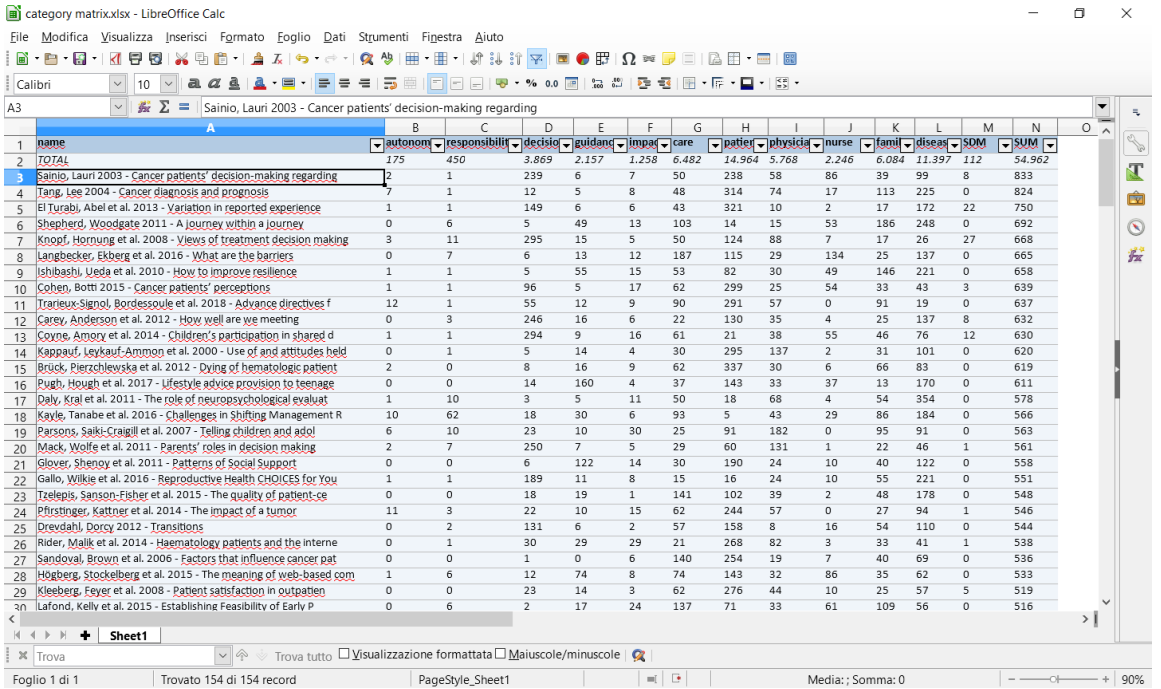
We can define a dictionary of synonyms and use them to run a paper and category based frequency analysis.



4. One ring to ‘read’ them all

The resulting excel spreadsheet offers almost endless possibilities: for instance, we can identify at a glance the papers that most likely will be more important for a certain topic alone (e.g: autonomy) or for any combination of different topics (e.g: autonomy and family).

Moreover, from the top row we have some insights on the corpus in general, knowing that for example the concept of responsibility is more debated than autonomy, that the role of physicians is less debated that the role of families but more than the role of nurses, and so on.

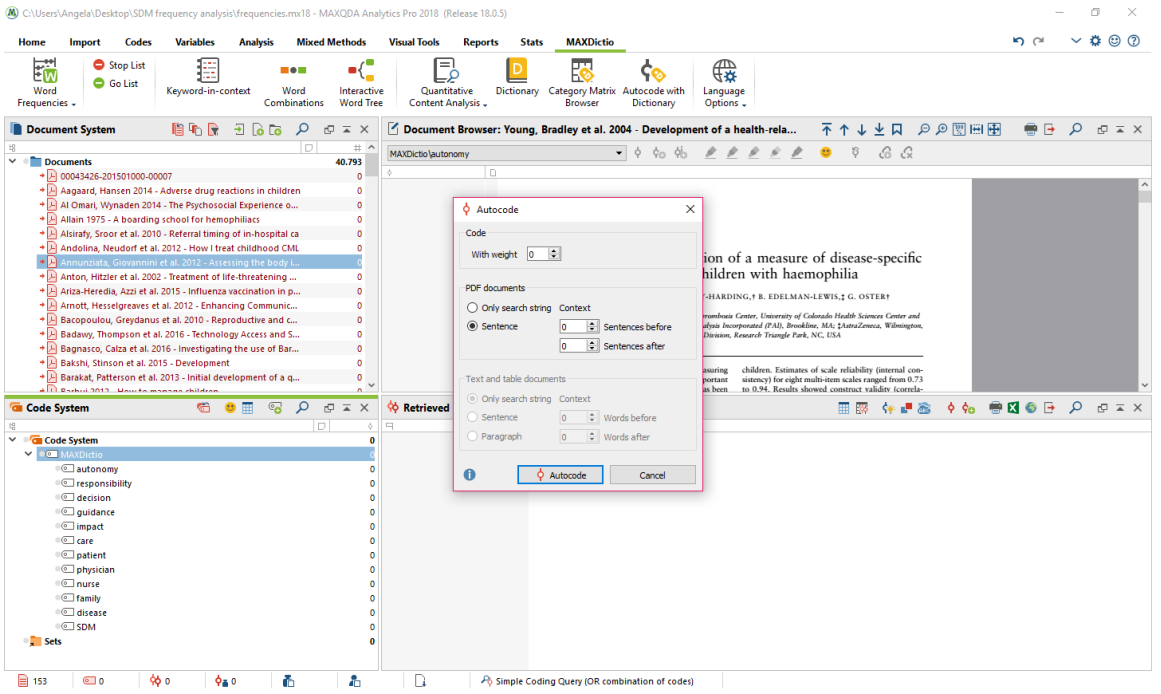


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	name	autonom	responsibilit	decisio	guidanc	impac	care	patier	physicia	nurse	famil	diseas	SDM	SUM	
2	*TOTAL*	*175*	*450*	*3.869*	*2.157*	*1.258*	*6.482*	*14.964*	*5.768*	*2.246*	*6.084*	*11.397*	*112*	*54.962*	
3	Sainio, Lauri 2003 - Cancer patients' decision-making regarding	2	1	239	6	7	50	238	58	86	39	99	8	833	
4	Tang, Lee 2004 - Cancer diagnosis and prognosis	7	1	12	5	8	48	314	74	17	113	225	0	824	
5	El Turabi, Abel et al. 2013 - Variation in reported experience	1	1	149	6	6	43	321	10	2	17	172	22	750	
6	Shepherd, Woodgate 2011 - A journey within a journey	0	6	5	49	13	103	14	15	53	186	248	0	692	
7	Knopf, Hornung et al. 2008 - Views of treatment decision making	3	11	295	15	5	50	124	88	7	17	26	27	668	
8	Langbecker, Ekberg et al. 2016 - What are the barriers	0	7	6	13	12	187	115	29	134	25	137	0	665	
9	Ishibashi, Ueda et al. 2010 - How to improve resilience	1	1	5	55	15	53	82	30	49	146	221	0	658	
10	Cohen, Botti 2015 - Cancer patients' perceptions	1	1	96	5	17	62	299	25	54	33	43	3	639	
11	Trarieux-Signol, Bordessoule et al. 2018 - Advance directives f	12	1	55	12	9	90	291	57	0	91	19	0	637	
12	Carey, Anderson et al. 2012 - How well are we meeting	0	3	246	16	6	22	130	35	4	25	137	8	632	
13	Coyne, Amory et al. 2014 - Children's participation in shared d	1	1	294	9	16	61	21	38	55	46	76	12	630	
14	Kappauf, Leykauf-Ammon et al. 2000 - Use of and attitudes held	0	1	5	14	4	30	295	137	2	31	101	0	620	
15	Brück, Pierzchlewska et al. 2012 - Dying of hematologic patient	2	0	8	16	9	62	337	30	6	66	83	0	619	
16	Pugh, Hough et al. 2017 - Lifestyle advice provision to teenage	0	0	14	160	4	37	143	33	37	13	170	0	611	
17	Daly, Kral et al. 2011 - The role of neuropsychological evaluat	1	10	3	5	11	50	18	68	4	54	354	0	578	
18	Kayle, Tanabe et al. 2016 - Challenges in Shifting Management R	10	62	18	30	6	93	5	43	29	86	184	0	566	
19	Parsons, Saiki-Craigill et al. 2007 - Telling children and adol	6	10	23	10	30	25	91	182	0	95	91	0	563	
20	Mack, Wolfe et al. 2011 - Parents' roles in decision making	2	7	250	7	5	29	60	131	1	22	46	1	561	
21	Glover, Shenoy et al. 2011 - Patterns of Social Support	0	0	6	122	14	30	190	24	10	40	122	0	558	
22	Gallo, Wilkie et al. 2016 - Reproductive Health CHOICES for You	1	1	189	11	8	15	16	24	10	55	221	0	551	
23	Tzelepis, Sanson-Fisher et al. 2015 - The quality of patient-ce	0	0	18	19	1	141	102	39	2	48	178	0	548	
24	Pfirstinger, Kattner et al. 2014 - The impact of a tumor	11	3	22	10	15	62	244	57	0	27	94	1	546	
25	Drevdahl, Dorcy 2012 - Transitions	0	2	131	6	2	57	158	8	16	54	110	0	544	
26	Rider, Malik et al. 2014 - Haematology patients and the interne	0	1	30	29	29	21	268	82	3	33	41	1	538	
27	Sandoval, Brown et al. 2006 - Factors that influence cancer pat	0	0	1	0	6	140	254	19	7	40	69	0	536	
28	Högberg, Stockelberg et al. 2015 - The meaning of web-based com	1	6	12	74	8	74	143	32	86	35	62	0	533	
29	Kleeberg, Feyer et al. 2008 - Patient satisfaction in outpatien	0	0	23	14	3	62	276	44	10	25	57	5	519	
30	Lafond, Kelly et al. 2015 - Establishing Feasibility of Early P	0	6	2	17	24	137	71	33	61	109	56	0	516	

4. One ring to ‘read’ them all

As a last treat, MaxQDA can autocode documents using our dictionaries: we can build a set of “subcorpuses” containing all the sentences that contain a specific set of keywords.

This is useful if for instance we want to explore what are the most commonly debated concepts in the sentences concerning autonomy, or patients, or any other category.



The nose problem

The value of these data is actually pretty low: from a frequency point of view the sentences “my nose is nice” and “my nose is not nice” are identical, because they both mention “nose” and “nice”.

These are not final results: they are powerful hints to plan the next steps.

For more details about this stuff: https://doi.org/10.1016/j.heliyon.2020.e04426

5. Here it gets very nerdy,

or: The Mighty Topic Tracker

What we can do so far:

- Perform and expand queries by text mining titles and abstracts (DB search engines + Voyant Tools)
- Download full texts using a reference management software
- Very basic full text analysis in MaxQDA

Hint: there's more in a db entry than meets the eye! Let's explore further this material with some Python-based NLP.

6. Here it gets very nerdy

Jupyter is a project and community whose goal is to "develop open-source software, open-standards, and services for interactive computing across dozens of programming languages".

Project Jupyter's name is a reference to the three core programming languages supported by Jupyter, which are Julia, Python and R, and also a homage to Galileo's notebooks recording the discovery of the moons of Jupiter.

Project Jupyter has developed and supported the interactive computing products Jupyter Notebook, JupyterHub, and JupyterLab.

6. Here it gets very nerdy

Why Python?

- it's high level (strong abstraction, little need to know what happens under the code)
- It's general purpose (you can write almost anything, ranging from a robot to a web application)
- It's easy to read and to learn (when compared with other programming languages)
- It's logical and tidy
- It's widely used and there's a ton of libraries to extend its core
- It's cross-platform (i.e. you can run Python code on Windows, Linux and MacOS)

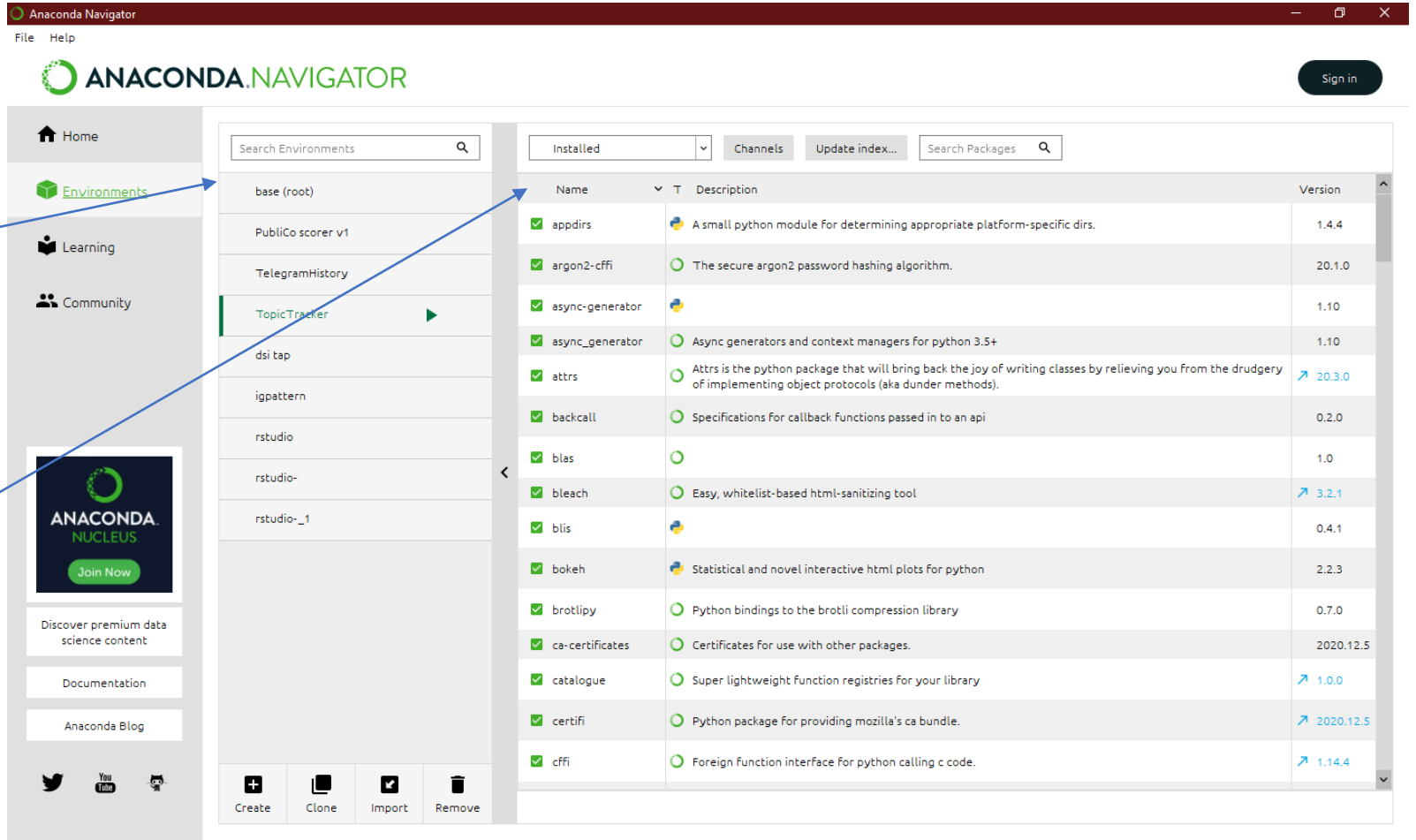
6. Here it gets very nerdy

Anaconda
A distribution of Python and R aimed to scientific programming that simplifies a lot installation, package management, environment management.

6. Here it gets very nerdy

Environments

Packages

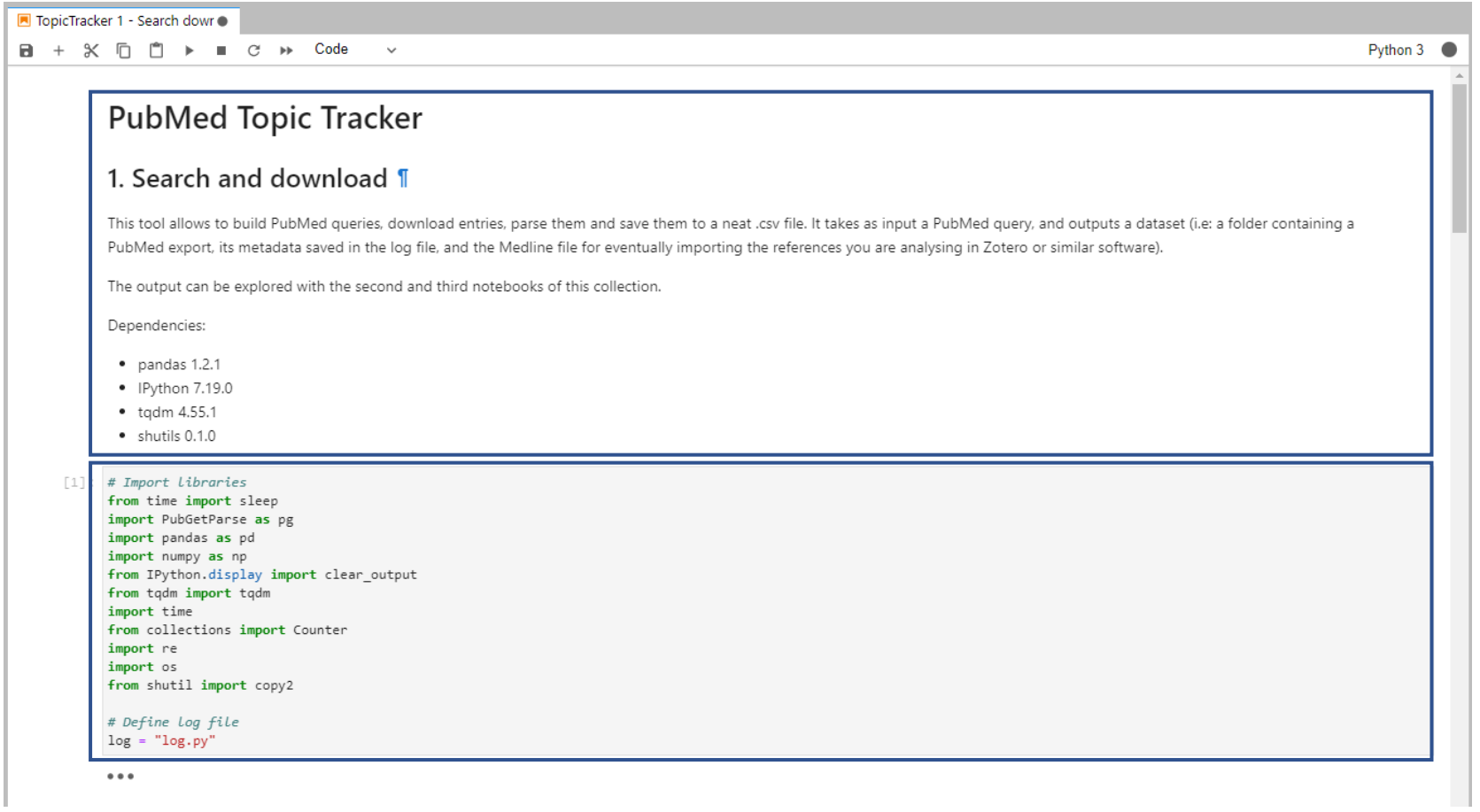


6. Here it gets very nerdy

Basic structure of a JupyterLab notebook

Comment blocks
In markdown

Code blocks
In this case it's Python



6. Here it gets very nerdy

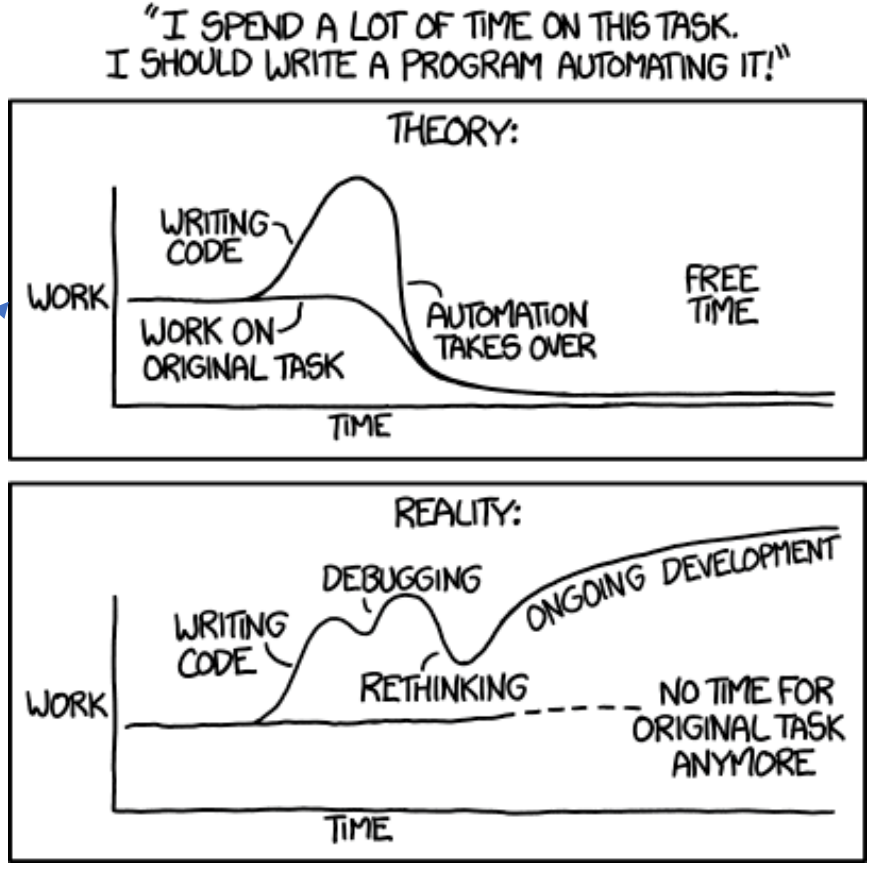
Why should I bother learning this stuff? I'm no programmer after all, right?

True. But we live in a world packed with data, and these are excellent tools to work on data. In Python you can do NLP, score a survey, map networks, autocode texts using very refined rules, and water the plants if need be. It's a skill worth acquiring.

Some cool examples I actually wrote and used for my research at the IBME:

- Factiva parser and NLP analysis
- Telegram social listening

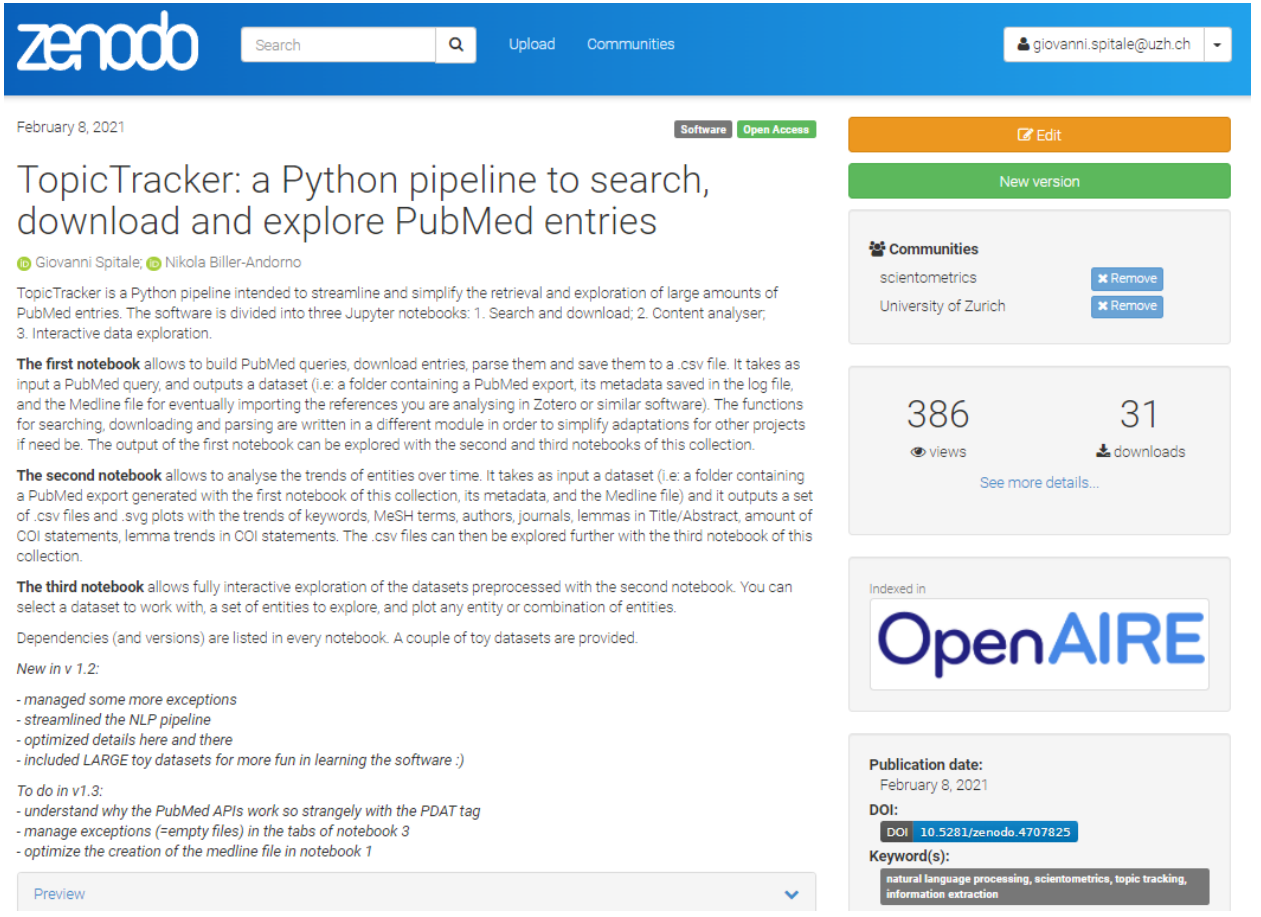
In this case, the "theory" case applies (most of the times!)



xkcd.com/

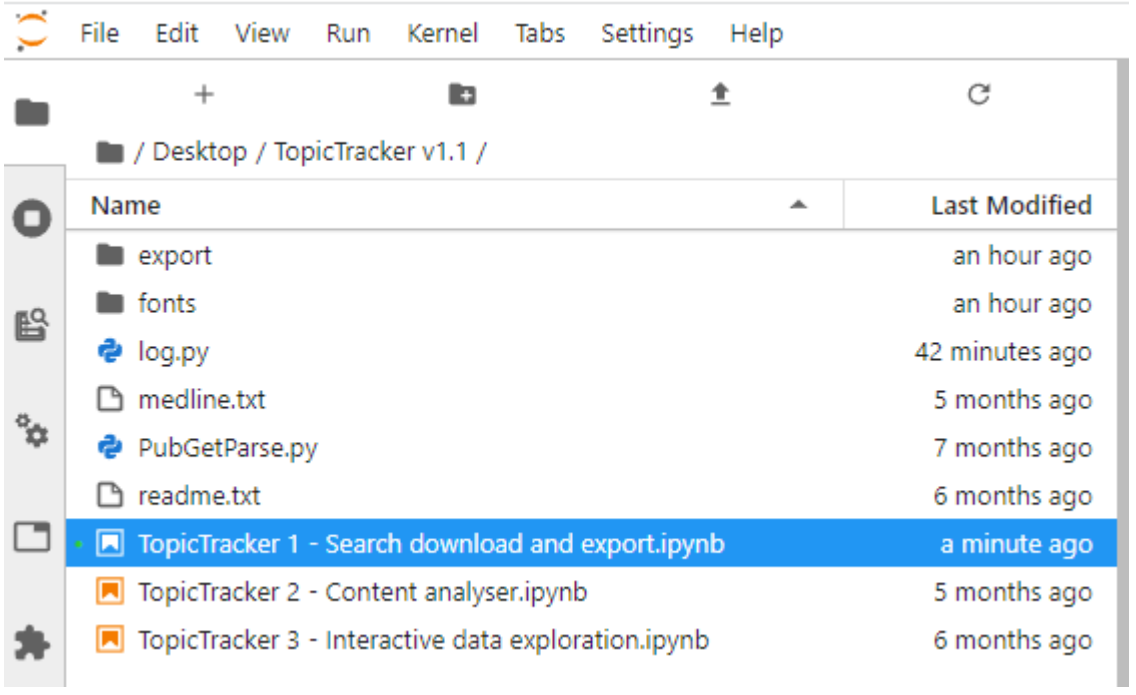
6. Here it gets very nerdy

Finding TopicTracker
Easy. As all my software, it's available on my Zenodo repo under a CC-BY license. Just google "zenodo topictracker" and download the latest version (currently 1.2.0)



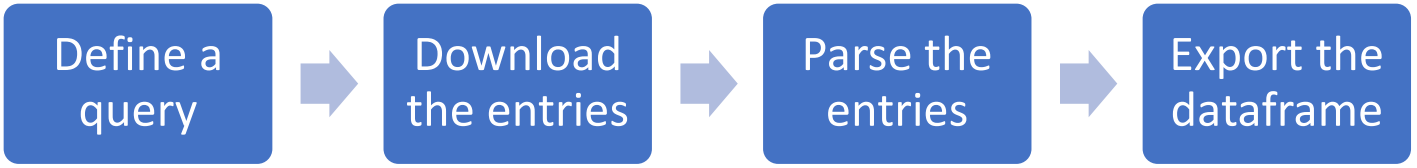
6. Here it gets very nerdy

Running TopicTracker
Easy. Just install Anaconda, create a new environment, install the dependencies listed in the notebooks, unzip the download in your desktop, launch JupyterLab, navigate to the right folder and open the first notebook by double clicking on it.



6. Here it gets very nerdy

Notebook 1 – Search, download and export



6. Here it gets very nerdy

Notebook 1 – Search, download and export

This doesn't do anything super fancy – basically it runs queries, gets entries like this...

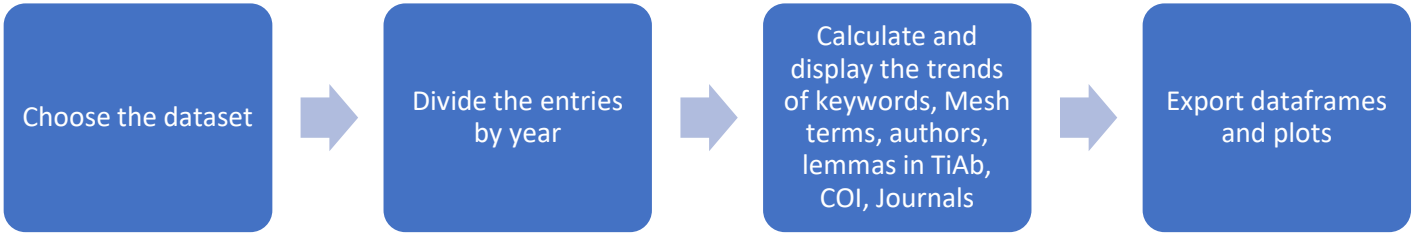
and transform them into a neat table like this one here:

```
PMID- 34612823
OWN - NLM
STAT- Publisher
LR  - 20211006
IS  - 1929-0748 (Print)
IS  - 1929-0748 (Linking)
DP  - 2021 Sep 22
TI  - PubliCo. A protocol for a new risk and crisis communication platform to bridge
      the gap between policy makers and the public in the context of the COVID-19
      crisis.
LID - 10.2196/33653 [doi]
AB  - BACKGROUND: Since the end of 2019, COVID-19 has had a significant impact on
      citizens around the globe. As governments institute more restrictive measures,
      public adherence could decrease and discontent mount. Providing high-quality
      information and countering fake news is important. But we also need feedback
      loops so that government officials can refine preventive measures and
      communication strategies. Policy-makers need information - preferably based on
      real-time data - on the public's cognitive, emotional and behavioural reaction t
      public health messages and restrictive measures. PubliCo aims to foster effecti
      and tailored risk and crisis communication as well as an assessment of the risks
      and benefits of prevention and control measures, as their effectiveness depends
      on public trust and cooperation. OBJECTIVE: Our project aims to develop a tool
      that helps tackle the COVID-19 infodemic, with a focus on enabling a nuanced an
      in-depth understanding of public perception. The project adopts a
      trans-disciplinary multi-stakeholder approach, including participatory citizen
      science. METHODS: We combine literature and media review and analysis and
      empirical research using mixed methods, including an online survey and
      diary-based research, both of which are ongoing and continuously updated.
      Building on real-time data and continuous data collection, our research results
      will be highly adaptable to the evolving situation. RESULTS: As of September
      2021, two thirds of the tool we propose are up and running. Current development
      cycles focus on the analytics component, on user experience, and on interface
      refinements. We collected a total of 473 responses through PubliCo Survey, and 2
      diaries through PubliCo Diaries. CONCLUSIONS: Pilot data show that PubliCo is a
      promising and efficient concept for bidirectional risk and crisis communication
      in the context of public health crises; further data are needed to assess its
      function at a larger scale or in the context of an issue other than COVID-19.
      CLINICALTRIAL:
FAU - Spitale, Giovanni
AU  - Spitale G
AD  - Institute of Biomedical Ethics and History of Medicine, University of Zurich,
      Winterthurerstrasse 30. Zurich. CH.
```

	p_id	pid_type	year	journal	publisher	title	book_title	abstract	oabstract	authors	editors	language	meshterms	keywords	coi	grant	doi
1	12349742	Article	2000	AIDS weekly	NaN	Malaysia urges ASEAN to tackle AIDS crisis.	NaN	Urgent action is needed to fight the alarming ...	NaN	NaN	NaN	eng	['*Acquired Immunodeficiency Syndrome', 'Asia'...	['*Acquired Immunodeficiency Syndrome', 'Asia'...	NaN	NaN	NaN
2	10795397	Article	2000	Occupational medicine (Oxford, England)	NaN	A South-East Asian perspective.	NaN	In order to discuss the subject of occupationa...	NaN	Koh D, Chia SE, Jeyaratnam J	NaN	eng	['Asia, Southeastern/epidemiology', 'Delivery ...	NaN	NaN	NaN	10.1093/occmed/50.1.64
3	14602265	Article	2003	The Annals of thoracic surgery	NaN	Peritoneal dialysis after surgery for congenit...	NaN	BACKGROUND: We determined the risk factors for...	NaN	Chan KL, Ip P, Chiu CS, Cheung YF	NaN	eng	['Acute Kidney Injury/etiology/*mortality/*the...	NaN	NaN	NaN	10.1016/s0003-4975(03)01026-9
4	14600111	Article	2003	Journal of epidemiology and community health	NaN	Monitoring community responses to the SARS epi...	NaN	STUDY OBJECTIVE: To report the evolution in pe...	NaN	Lau JT, Yang X, Tsui H, Kim JH	NaN	eng	['Adolescent', 'Adult', 'Attitude to Health', ...	NaN	NaN	NaN	10.1136/jech.57.11.864

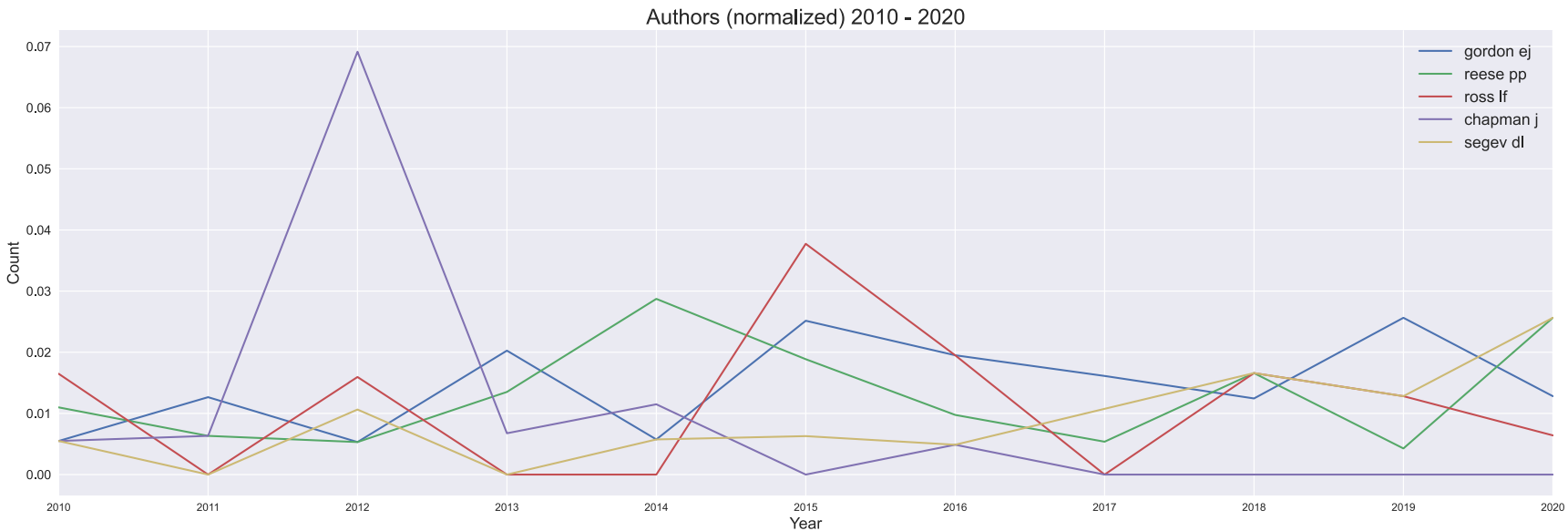
6. Here it gets very nerdy

Notebook 2 – Content analysis



6. Here it gets very nerdy

Notebook 2 – Content analysis (organ transplantation and ethics – authors, normalized)



6. Here it gets very nerdy

Notebook 2 – Content analysis (organ transplantation and ethics - keywords)

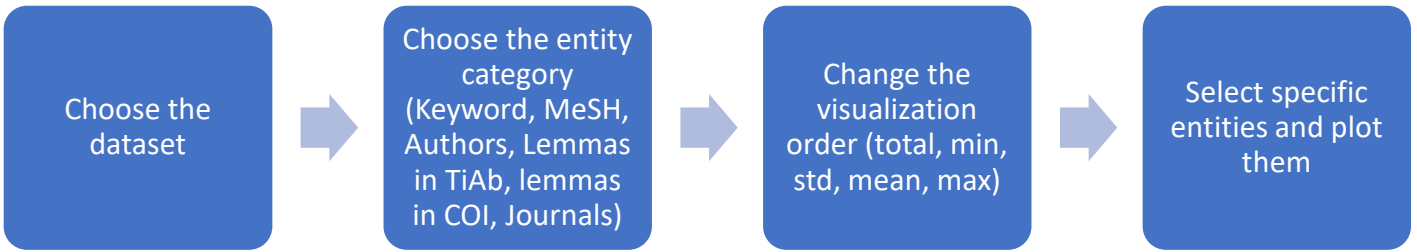
6. Here it gets very nerdy

Notebook 2 – Content analysis (organ transplantation and ethics – journals, normalized)

journal	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	total	min	std	mean	max
american journal of transplantation	0,06	0,03	0,05	0,03	0,06	0,12	0,16	0,20	0,12	0,14	0,23	0,97	0,03	0,06	0,10	0,20
transplantation	0,03	0,05	0,05	0,03	0,06	0,06	0,05	0,06	0,03	0,03	0,04	0,47	0,03	0,01	0,05	0,06
journal of medical ethics	0,02	0,03	0,02	0,04	0,06	0,06	0,05	0,04	0,02	0,03	0,04	0,39	0,02	0,02	0,04	0,06
transplantation proceedings	0,05	0,09	0,04	0,04	0,03	0,04	0,00	0,02	0,02	0,04	0,04	0,37	0,00	0,02	0,04	0,09
the american journal of bioethics	0,07	0,13	0,04	0,00	0,03	0,04	0,01	0,01	0,01	0,00	0,01	0,33	0,00	0,04	0,03	0,13
bmj open	0,00	0,00	0,00	0,01	0,00	0,05	0,02	0,05	0,02	0,06	0,05	0,21	0,00	0,02	0,02	0,06
bioethics	0,01	0,01	0,01	0,01	0,02	0,02	0,01	0,01	0,04	0,01	0,01	0,16	0,01	0,01	0,02	0,04
liver transplantation	0,02	0,03	0,01	0,03	0,01	0,03	0,00	0,02	0,01	0,00	0,00	0,16	0,00	0,01	0,02	0,03
cambridge quarterly of healthcare ethics	0,01	0,03	0,02	0,05	0,01	0,00	0,01	0,00	0,02	0,01	0,00	0,16	0,00	0,02	0,02	0,05
progress in transplantation	0,03	0,01	0,01	0,01	0,02	0,00	0,01	0,02	0,01	0,02	0,01	0,14	0,00	0,01	0,01	0,03

6. Here it gets very nerdy

Notebook 3 – Interactive data exploration



6. Here it gets very nerdy

Notebook 3 – Interactive data exploration (Bioethics subset 2015 - 2021)

Here you can choose the different datasets (downloaded and parsed with notebook 1 and analyzed with notebook 2).

The input field is dynamic, so you can start typing and it will autocomplete suggesting existing datasets.

Datasets available:

	dirname	year0	year1	query	paper_count	querydatetime
1	20210329-104455	2010	2020	organ transplantation AND ethics	2034	2021.03.29-09:54:03
2	20210329-112955	1988	2021	"grappa"[All Fields] AND alcohol[All Fields] NOT psoriasis[All Fields]	29	2021.03.29-11:29:11
3	20210415-224439	2015	2021	bioethics[sb]	74746	2021.04.15-09:18:15
4	20210427-143313	2000	2005	(((((“risk”[MeSH Terms] OR “risk”[All Fields]) AND “crisis”[All Fields] AND (“communicate”[All Fields] OR “communicated”[All Fields] OR “communicates”[All Fields] OR “communicating”[All Fields] OR “communication”[MeSH Terms] OR “communication”[All Fields] OR “communications”[All Fields] OR “communicators”[All Fields])) OR “crisis”[All Fields]) AND (“communicate”[All Fields] OR “communicated”[All Fields] OR “communicates”[All Fields] OR “communicating”[All Fields] OR “communication”[MeSH Ter…	20	2021.04.27-14:32:59
5	20210531-150441	2010	2021	(((((“risk”[MeSH Terms] OR “risk”[All Fields]) AND “crisis”[All Fields] AND (“communicate”[All Fields] OR “communicated”[All Fields] OR “communicates”[All Fields] OR “communicating”[All Fields] OR “communication”[MeSH Terms] OR “communication”[All Fields] OR “communications”[All Fields] OR “communicators”[All Fields])) OR “crisis”[All Fields]) AND (“communicate”[All Fields] OR “communicated”[All Fields] OR “communicates”[All Fields] OR “communicating”[All Fields] OR “communication”[MeSH Ter…	232	2021.05.31-15:02:08
6	20210531-154820	2000	2021	(((((“risk”[MeSH Terms] OR “risk”[All Fields]) AND “crisis”[All Fields] AND (“communicate”[All Fields] OR “communicated”[All Fields] OR “communicates”[All Fields] OR “communicating”[All Fields] OR “communication”[MeSH Terms] OR “communication”[All Fields] OR “communications”[All Fields] OR “communicators”[All Fields])) OR “crisis”[All Fields]) AND (“communicate”[All Fields] OR “communicated”[All Fields] OR “communicates”[All Fields] OR “communicating”[All Fields] OR “communication”[MeSH Ter…	273	2021.05.31-15:45:22

•••

Dataset: 20210415-224439

Select

```
Using dataset: "20210415-224439"

Time interval: 2015 - 2021
Keywords: bioethics[sb]
74746 entries
```

Dataset ready for analysis.

6. Here it gets very nerdy

Notebook 3 – Interactive data exploration (Bioethics subset 2015 - 2021)

The tabs represent the categories of entities you can play with.

‘Sort by’ lets you specify how to sort the data (as the dataset is big, you will only see the top 20)

Keyword | MeSH | Authors | Lemmas in TiAb | Lemmas in COI | Journals

Sort by: total

	keywords	df_2015	df_2016	df_2017	df_2018	df_2019	df_2020	df_2021	total	min	std	mean	max
1	ethics	491	309	331	279	330	443	257	2440	257	86.26	348.57	491
2	informed consent	151	114	117	95	114	136	80	807	80	23.69	115.29	151
3	bioethics	91	86	74	55	73	137	74	590	55	25.90	84.29	137
4	palliative care	94	56	71	72	78	94	40	505	40	19.51	72.14	94
5	autonomy	91	75	63	51	61	69	46	456	46	15.10	65.14	91
6	research ethics	109	56	62	48	42	90	46	453	42	25.26	64.71	109
7	qualitative research	56	56	55	45	66	51	29	358	29	11.63	51.14	66
8	abortion	68	38	57	48	47	69	18	345	18	17.85	49.29	69
9	nursing	43	46	40	48	70	51	22	320	22	14.29	45.71	70
10	medical ethics	48	48	61	30	53	55	19	314	19	14.94	44.86	61
11	communication	50	42	50	31	39	42	20	274	20	10.68	39.14	50
12	advance care planning	34	24	41	40	51	44	38	272	24	8.41	38.86	51
13	professionalism	40	37	49	33	53	46	11	269	11	13.95	38.43	53
14	public health	45	36	33	28	28	58	35	263	28	10.69	37.57	58
15	clinical ethics	46	35	17	29	25	64	43	259	17	15.59	37.00	64
16	consent	37	35	47	35	46	35	22	257	22	8.34	36.71	47
17	privacy	46	38	38	32	37	46	19	256	19	9.24	36.57	46
18	advance directives	34	34	37	30	37	40	42	254	30	4.03	36.29	42
19	education	57	35	29	25	41	48	16	251	16	14.03	35.86	57
20	euthanasia	41	29	22	25	38	49	36	240	22	9.52	34.29	49

6. Here it gets very nerdy

Notebook 3 – Interactive data exploration (Bioethics subset 2015 - 2021)

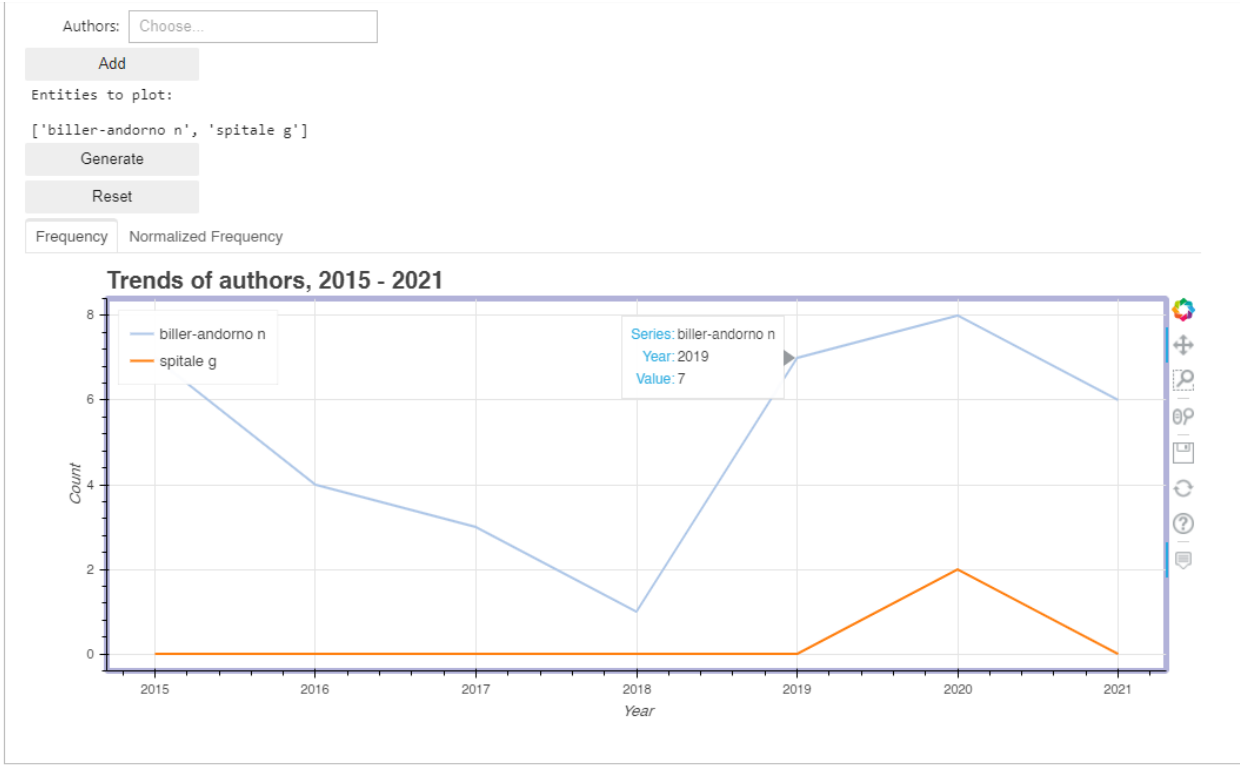
Select the entities to plot, click on ‘add’, then generate the plot.

Again, the input field is dynamic, so you can start typing and it will suggest existing entities.

You can see frequencies or normalized frequencies (click on the appropriate tab).

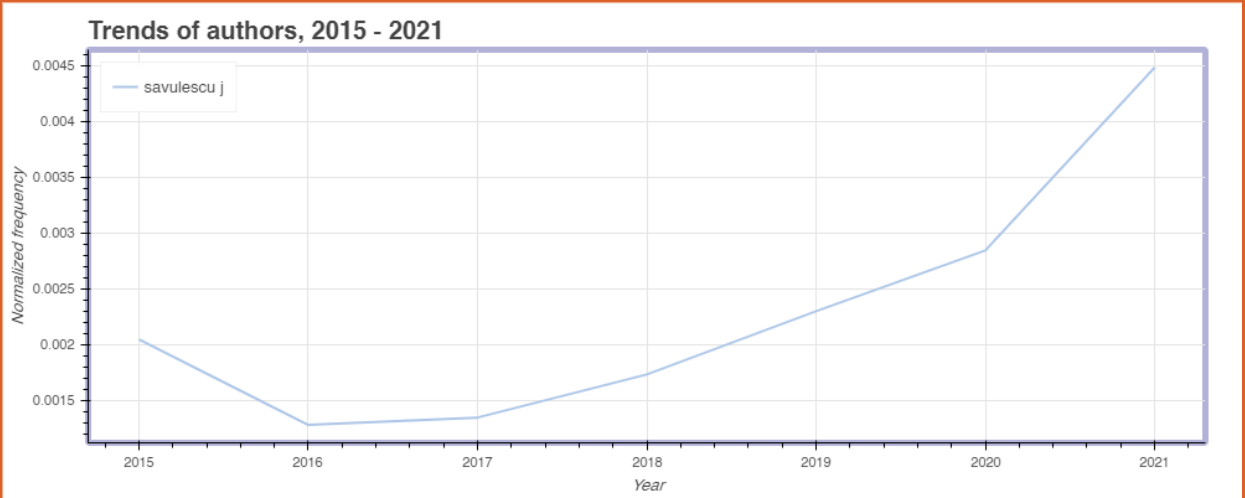
Hovering on a data point you’ll see a hoverbox with further details.

Did I write more papers than my boss? Nope – but I wrote plenty of code!



For what is this useful?

- For query expansion – in a more refined way, differentiating between lemmas, keywords and MeSH;
- For plotting the trend of a concept in a field over time;
- For finding someone with extensive experience in some very specific field (you might want them at a conference, or as external supervisors, or as suggested reviewers, …);
- For pre-mapping the topics you're going to find in a literature review;
- For picking the right journal (more on this topic later)
- *For bragging with your mom as soon as you finally publish more than your boss…*
- *… and for a bath of humility when you see that even at the very top of the pyramid your normalized impact on the field is still (quantitatively) insignificant.*



6. Open is cool

6. Open is cool

https://www.uzh.ch/en/researchinnovation/openscience.html

Open Science at UZH:

LERU member since 2006 (league of European research universities)

DORA signatory since 2014 (San Francisco Declaration on Research Assessment)

LERU roadmap to open science 2018

Swissuniversities: Open access strategy 2017, Open research data strategy (end 2020)

6. Open is cool

• 2011: data has to be shared (Funding Regulations)

• September 2015: the SNSF discussed the foundations of Open Research Data strategies during an international workshop

• 2016: Discussions at the Presiding Board and Administrative Offices

• October 2017: the policy enters into force in the project funding scheme.

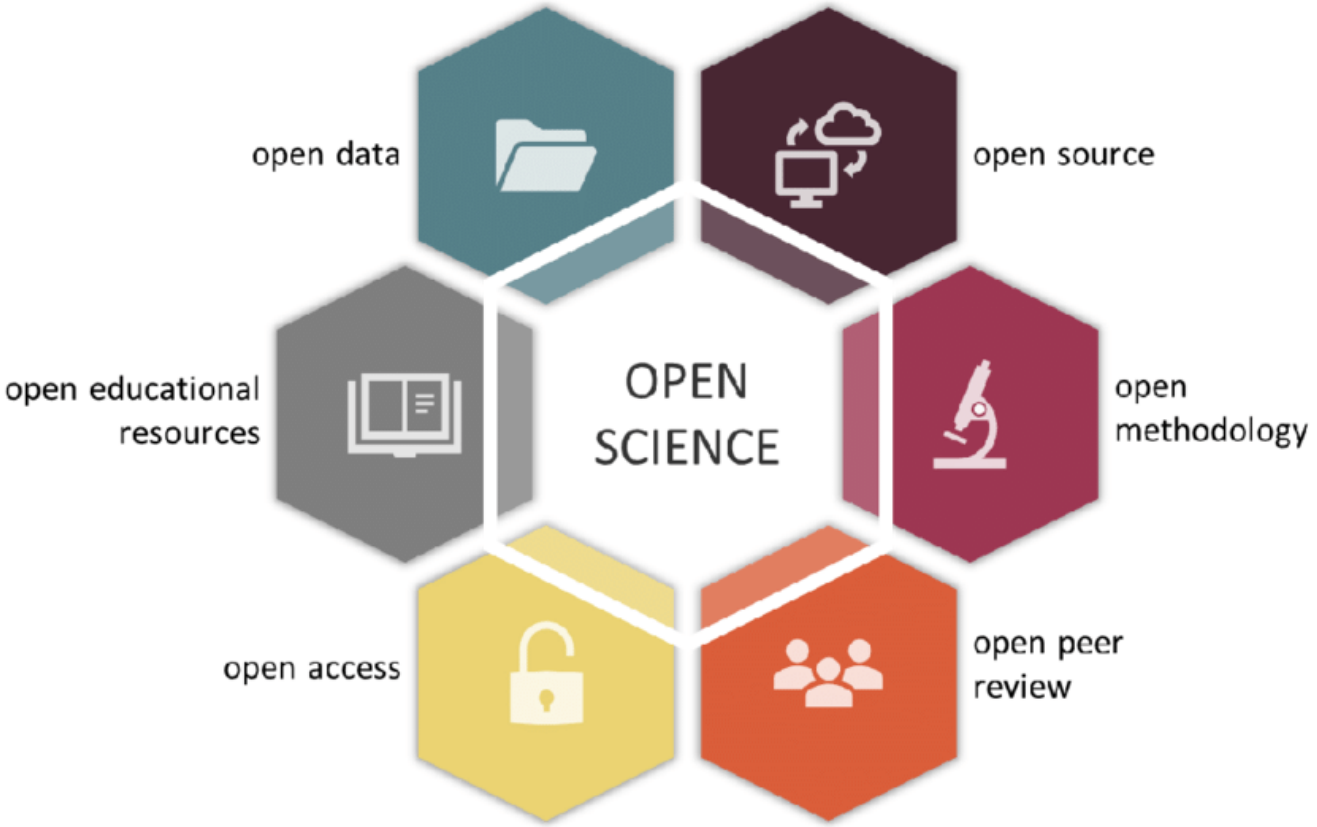
• Data Management Plans (DMP) are now required in most of SNSF funding schemes

•Funding Regulations Article 47 on publication and accessibility of research results :
«data collected with the aid of an SNSF grant must be made available to other researchers and integrated into recognized scientific data pools»

FNSNF

FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION

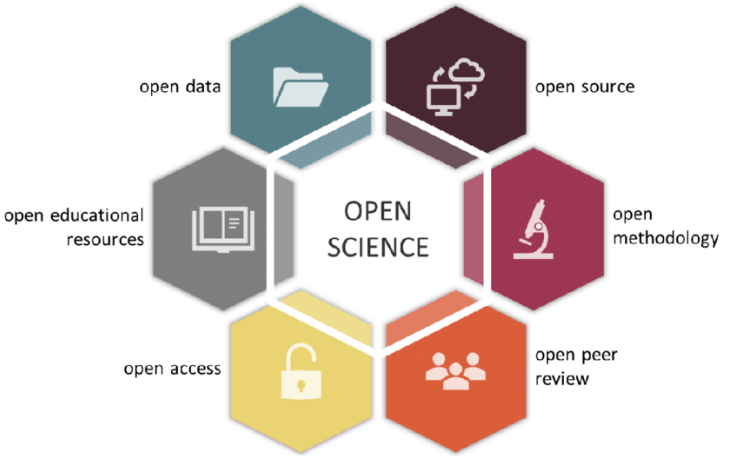
6. Open is cool



6. Open is cool

Search:

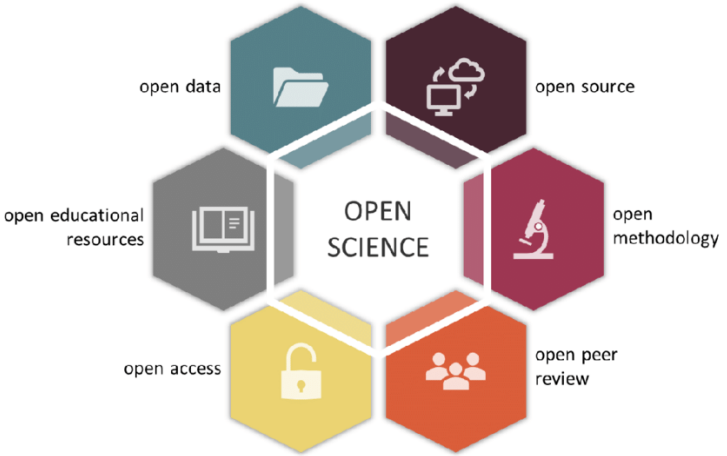
- Use pre-existing datasets (e.g. open data repositories like Zenodo)
- Use shared reference libraries (e.g. Zotero)
- Share grant proposals (e.g. at RIO)
- Read and search OA journals (DOAJ or Sherpa/Romeo)
- Involve citizen science organizations (if possible)
- Make use of wikimedia projects or contribute to them (e.g. wikipedia, wikidata, etc.)



6. Open is cool

Analysis:

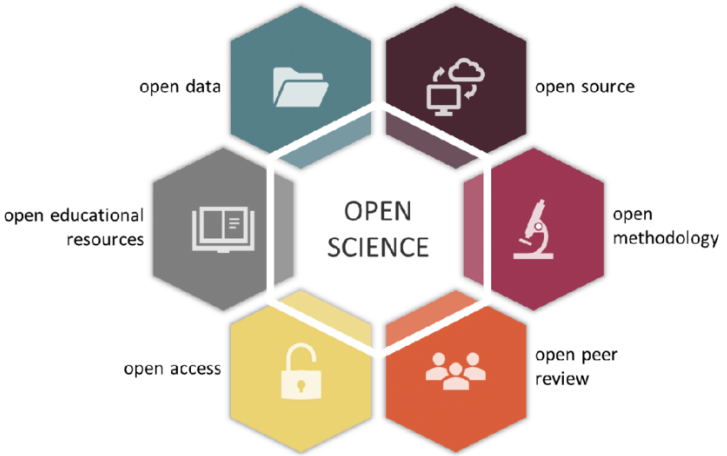
- Pre-register your research (e.g. Registered Reports, or OSF)
- Share protocols and workflows (e.g. at protocols.io)
- Share notebooks (e.g. OpenNotebookScience)
- Share code, (e.g. via Github, as Jupyter notebooks)
- Share data (e.g. via Dryad, Zenodo, or Dataverse; see re3data.org for repositories)
- Make a data management plan
- Use open-source software and open formats



6. Open is cool

Writing:

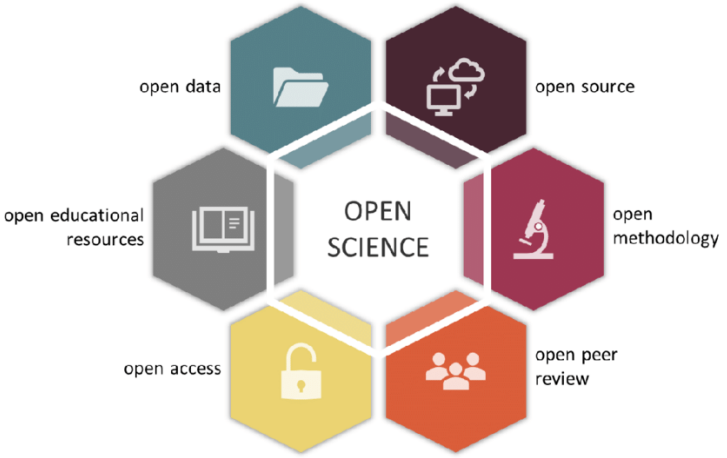
- Open XML or OpenDocument drafting
- Use actionable formats when mixing code and text, e.g. Jupyter or Markup / Latex
- Make use of tools such as wikidata, open refine, etc.
- Include citations for software / datasets
- Discuss findings outside the institute before publishing



6. Open is cool

Dissemination:

- Advocate for open science
- Collaborate with researchers who practice open science
- Use social media or other platforms to talk about your work
- Use open science identifiers (DOIs and ORCIDs) for yourself and all your work
- Inform the wider public / community about your research (e.g. conferences)
- Involve Citizen Science organizations
- Publish your preprints (e.g. on Zenodo or OSF)
- Publish open access!



6. Open is cool

Benefits of Open Access

6. Open is cool

Cc-by University of Waikato

+ BLACK ROUTE

(legal in CH!)

The basics:

- Register an ORCID
- Use open data (when available) and release your data (Zenodo)
- Pre-register your research and share your protocols (OSF, Zenodo)
- Use open software (LibreOffice, Zotero, R, Python, ...)
- Archive your preprints (OSF, Zenodo)
- Publish on OA journals (DOAJ, Sherpa/Romeo)

7. Pick a journal

7. Pick a journal

From DORA:

- citation distributions within journals are highly skewed;

- the properties of the Journal Impact Factor are field-specific: it is a composite of multiple, highly diverse article types, including primary research papers and reviews

- Journal Impact Factors can be manipulated (or “gamed”) by editorial policy;

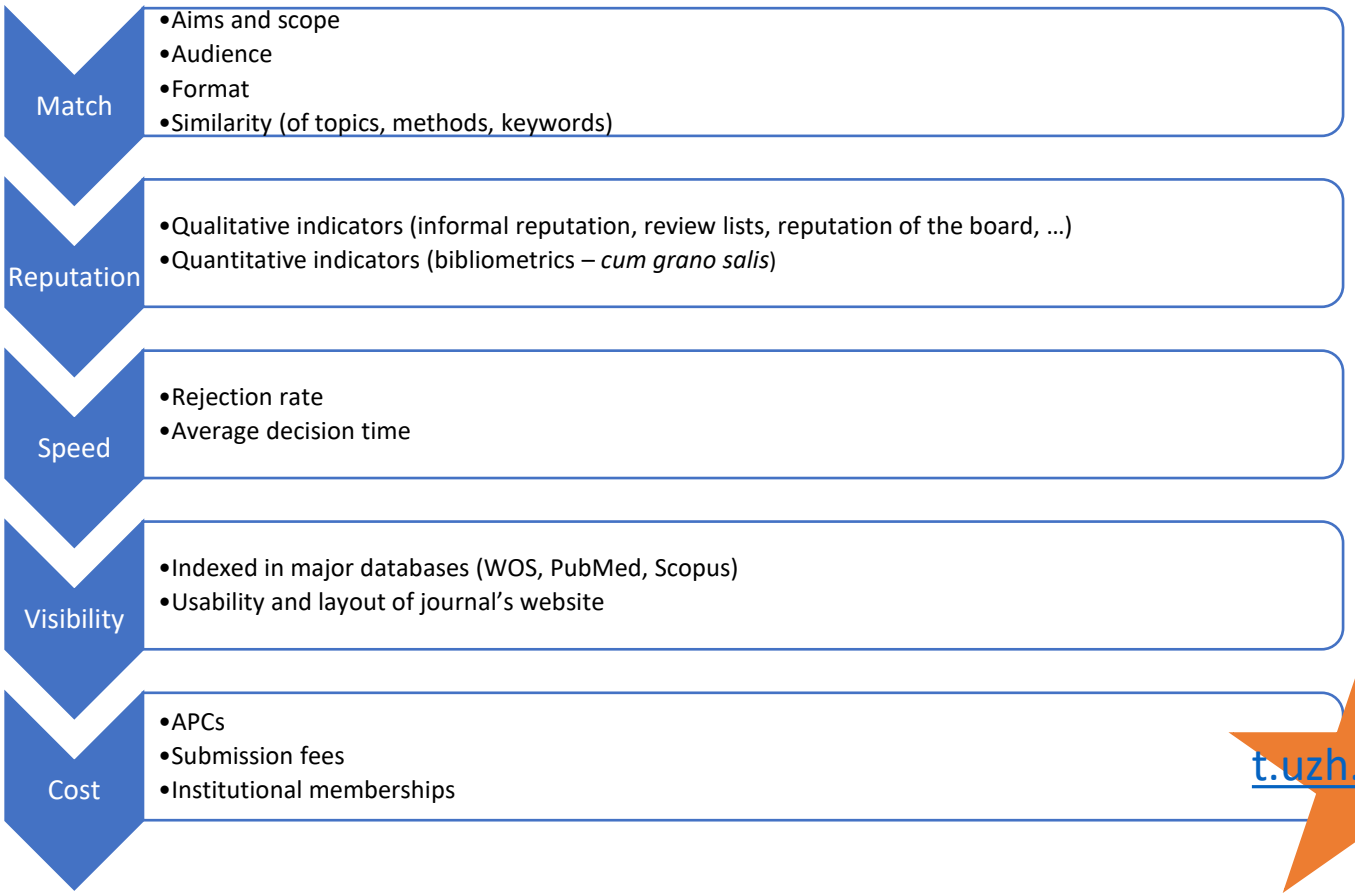
- data used to calculate the Journal Impact Factors are neither transparent nor openly available to the public

- the need to eliminate the use of journal-based metrics, such as Journal Impact Factors, in funding, appointment, and promotion considerations;

- the need to assess research on its own merits rather than on the basis of the journal in which the research is published; and

- the need to capitalize on the opportunities provided by online publication (such as relaxing unnecessary limits on the number of words, figures, and references in articles, and exploring new indicators of significance and impact).

7. Pick a journal



t.uzh.ch/1eb

7. Pick a journal

Match:
https://bioethics.georgetown.edu/bioethics-journals/
https://endnote.com/product-details/manuscript-matcher/
http://jane.biosemantics.org
https://journalfinder.elsevier.com
https://www.journalguide.com/
https://journalsuggester.springer.com
TopicTracker

Reputation:
https://beallslist.net
https://clarivate.com/products/journal-citation-reports/
https://www.elsevier.com/solutions/scopus/how-scopus-works/metrics
https://www.journalindicators.com/indicators
www.metrics-toolkit.org
https://academic.microsoft.com/journals
www.scimagojr.com/journalrank.php
https://thinkchecksubmit.org

Speed:
https://scirev.org
www.journalguide.com
http://journalreviewer.org

Visibility:
https://doaj.org
https://v2.sherpa.ac.uk/romeo/search.html

Costs:
https://doaj.org
http://www.eigenfactor.org/openaccess/

Thanks to Dr. Philipp Mayer for the input
https://science-textflow.ch

8. Discussion

SUMMARIZING:

- Amount of available literature
- Smart iterative search strategies
- Optimizing retrieval
- Content mining with MaxQDA
- TopicTracker
- Basics of open science
- Pick a journal (in a conscious way)

THANKS FOR YOUR TIME!

The owl of Minerva is watcing you.

University of Zurich[UZH]
Institute of Biomedical Ethics
and History of Medicine