
SLEEP-DISORDERED BREATHING(SDB) RESEARCH PAPERS ABOUT OBESITY

Yilin Wei

GOAL

- Investigation of sleep-disordered breathing(**SDB**) research about **obesity**
 - Who did more research in this field?
 - What are their connections look like?
 - Who is expert?
 - What are topics?
 - When and where the paper was published?
-

DATASET

- **4087** papers sleep-disordered breathing(SDB) research papers about obesity from PubMed
- Use **Genism** with Python(LDA) to cluster title and abstract into **6** topics for each record
- One paper may have
 - None author: because of the limitation of data scraped
 - Many authors: need **transform** data to create social network
 - Here we just use the first author in each **record**
- Use **Stanford Named Entity Recognizer (NER)** to extract organization and location information

ID	TITLE	ABSTRACT	YEAR	MAGAZINE	AUTHORI	TOPIC	ORGANIZATIO N	LOCATION
25197813	Combined effects of sleep disordered breathing and	To examine the combined impact of sleep disordered	2014	Sleep.	Korcarz CE	3	Barnet, University of Wisconsin	
25499598	Sleep-disordered breathing, sleep duration, and	To examine independent associations between sleep-disordered	2015	J Pediatr.	Bonuck K	2	Medical Research Council	Bristol, United Kingdom
24048143	Central sleep apnea in obese children with sleep-	In contrast to obstructive sleep apnea (OSA), central sleep	2014	Int J Obes (Lond).	Chou CH	2	Department of Otolaryngology, National	

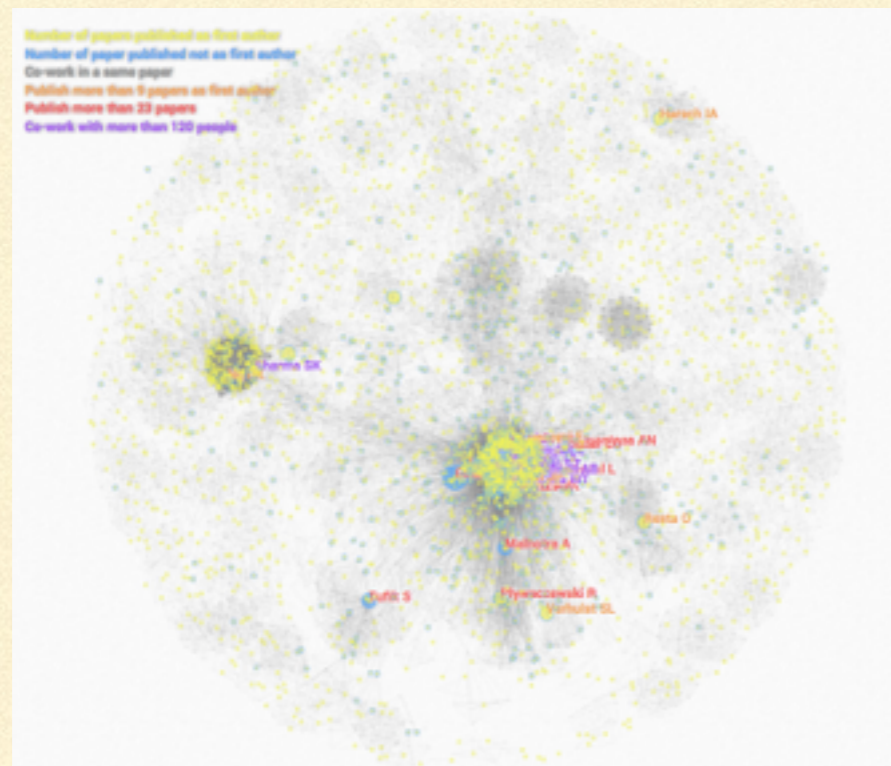
DATASET - SOCIAL NETWORK

- JSON file for creating social network graph
 - Nodes: author
 - Edges: co-work in same paper

```
{
  "nodes": [
    {
      "name": "Gozal D",
      "Count": 65, //number of papers
      "Topic0": 0, //number of papers in topic0
      "Topic1": 6,
      "Topic2": 0,
      "Topic3": 5,
      "Topic4": 0,
      "Topic5": 0,
      "Countfirst": 11, // number of papers as first author
      "Countother": 54, // number of papers not as first author
      "Connections": 179 // number of people working on same paper
    },
    ...
  ],
  "links": [
    {
      "source": 5705,
      "target": 9164,
      "weight": 1 //number of times publish paper together
    },
    .....
  ],
}
```

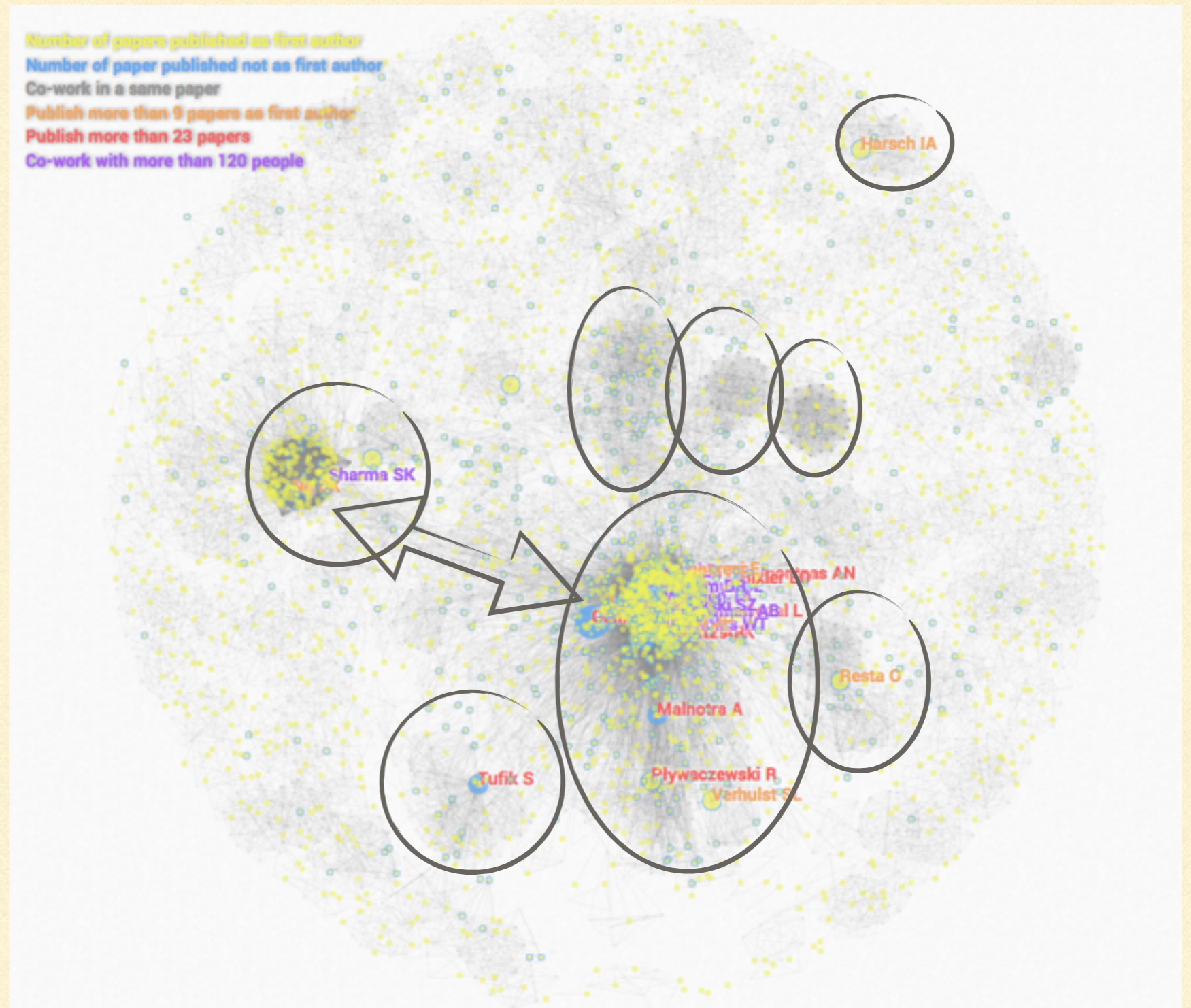

VISUALIZATION

- http://yilinwei.com/project/SDB_about_obesity
- Tools
 - D3.js, Crossfilter.js, Dc.js, HTML, Bootstrap
- Structure
 - A force-layout to present relation between all authors
 - Bar charts to show number of articles by topic, author, magazine, organization, location and year
 - A table to list filter results and link to PubMed for further information



FINDINGS

- There are **8** main cluster doing research about SDO and obesity
- The most important two are **Malnotra A** community and **Sharma SK** community
- Resta O, Harsch IA etc. are experts in this field



FINDINGS

- Cluster of title and abstract give us these 6 topics

- topic diff=0.607451, rho=0.577350

- topic #0 (0.167): 0.003*gh + 0.003*imt + 0.002*craniofacial + 0.002*osa + 0.002*osahs + 0.002*dimensions + 0.002*pws + 0.002*cephalometric + 0.002*soft + 0.002*maxillomandible

- topic #1 (0.167): 0.005*osa + 0.004*cardiovascular + 0.003*disease + 0.003*apnea + 0.003*osas + 0.003*syndrome + 0.002*obstructive + 0.002*hypertension + 0.002*treatment + 0.002*airway

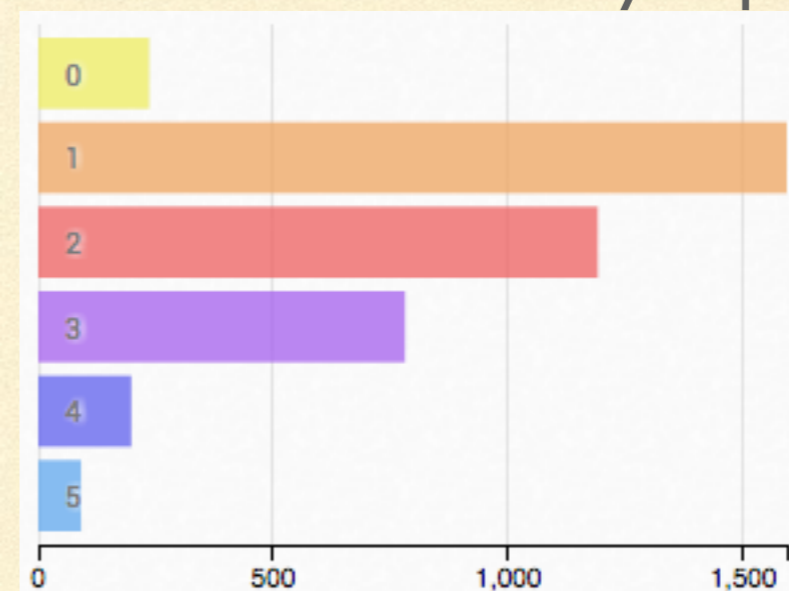
- topic #2 (0.167): 0.006*osas + 0.005*cpap + 0.003*+/- + 0.003*p + 0.003*osa + 0.003*0 + 0.003*patients + 0.002*treatment + 0.002*airway + 0.002*pulmonary

- topic #3 (0.167): 0.004*osa + 0.003*cardiovascular + 0.003*osas + 0.003*hypertension + 0.002*inflammation + 0.002*patients + 0.002*bradyarrhythmia + 0.002*disease + 0.002*+/- + 0.002*0

- topic #4 (0.167): 0.005*pickwick + 0.004*stroke + 0.002*syndrome + 0.001*aspects + 0.001*disorders + 0.001*imbalance + 0.001*advancements + 0.001*modifiable + 0.001*snoring + 0.001*pathogenesis

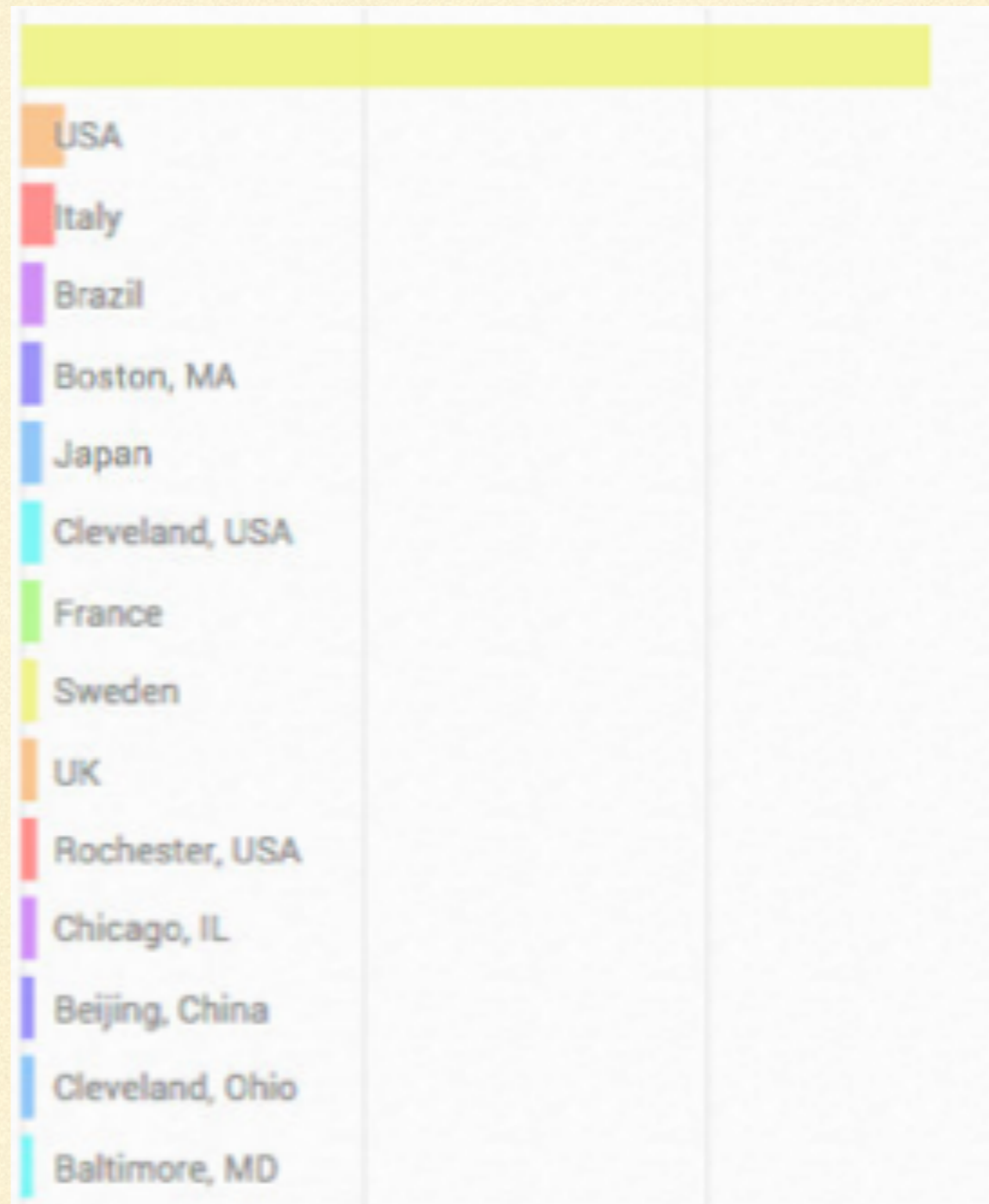
Topic 1 has the largest number of paper

Number of Articles by Topics



FINDINGS

- Most of research was conducted at
 - City: Boston, Cleveland, Rochester, Chicago, Beijing, Baltimore etc.
 - Country: USA, Italy, Brazil, Japan, France, Sweden, UK, China etc.

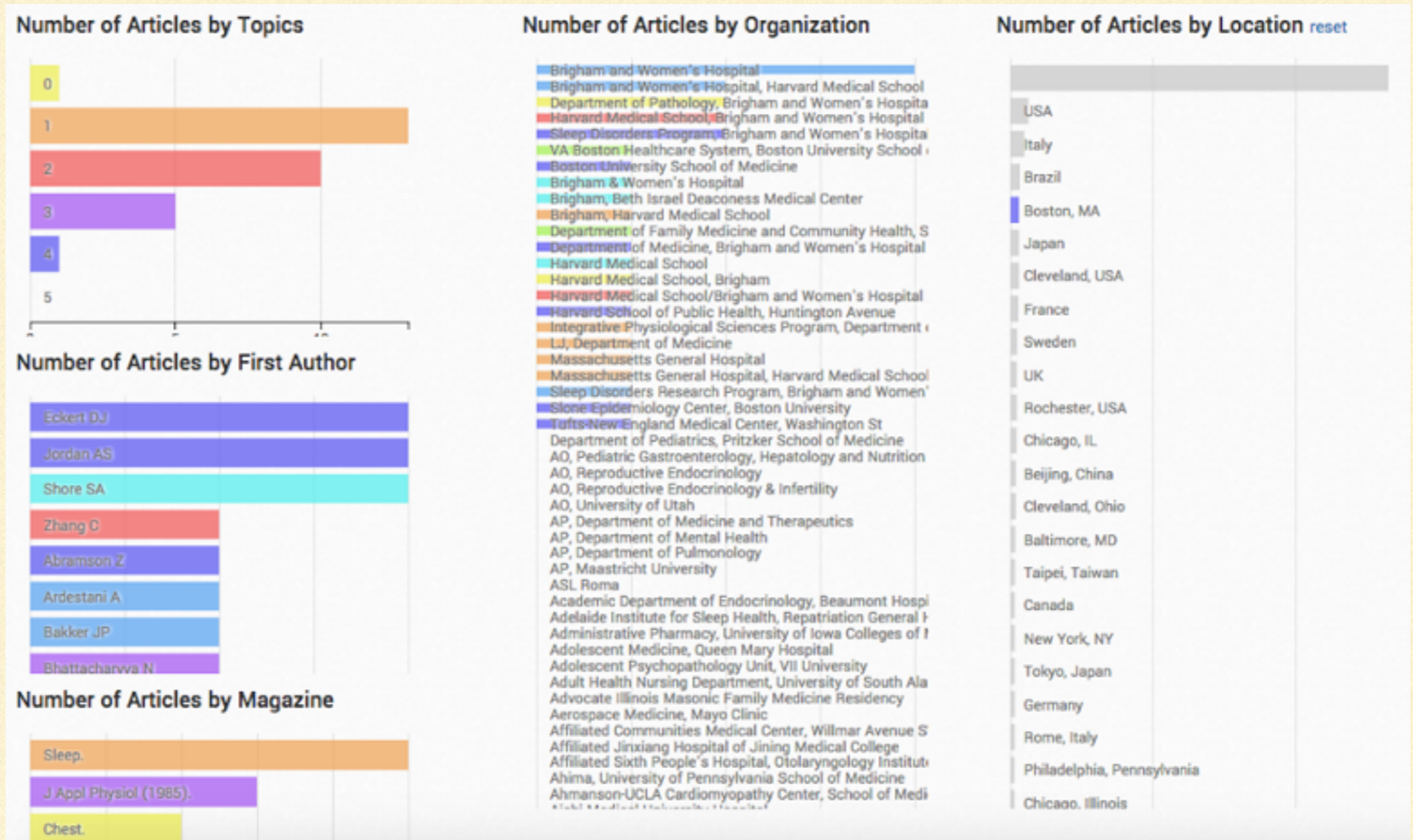


FINDINGS

Boston

- Brigham and Women's Hospital - most important research organization

- Eckert DJ, Jordan AS and Shore SA - experts

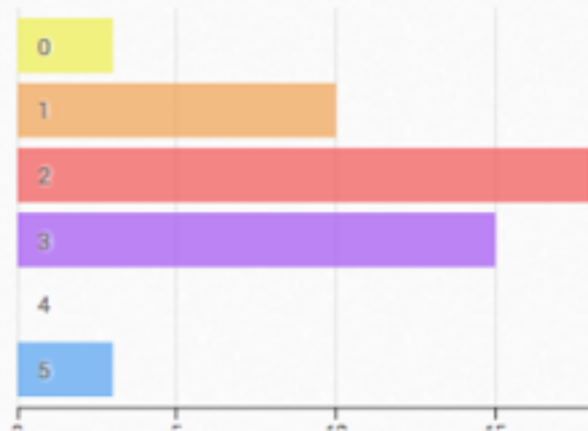


FINDINGS

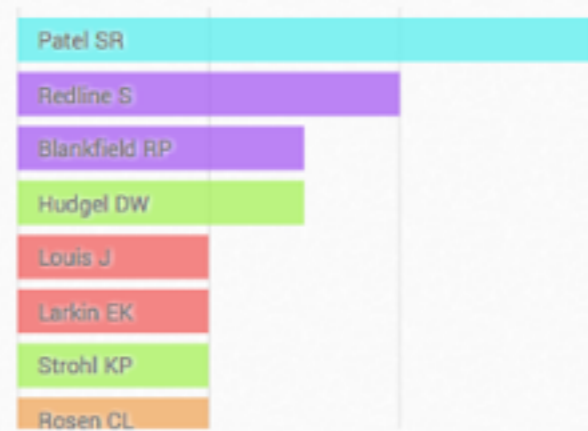
Cleveland

- Case Western Reserve University - most important research organization
- Patel SR and Redline S - experts
- Researches in Cleveland focus more on topic 2 and 3

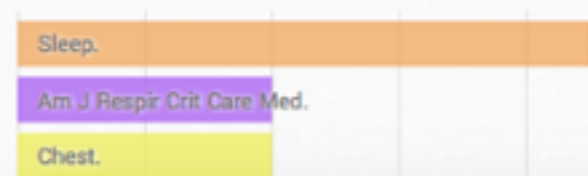
Number of Articles by Topics



Number of Articles by First Author



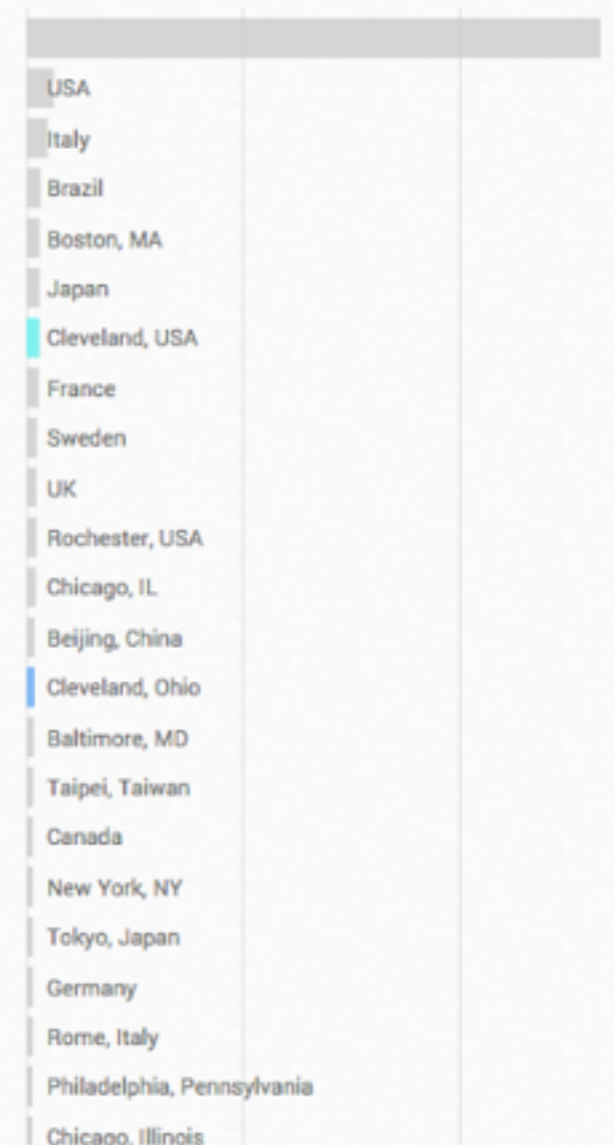
Number of Articles by Magazine



Number of Articles by Organization



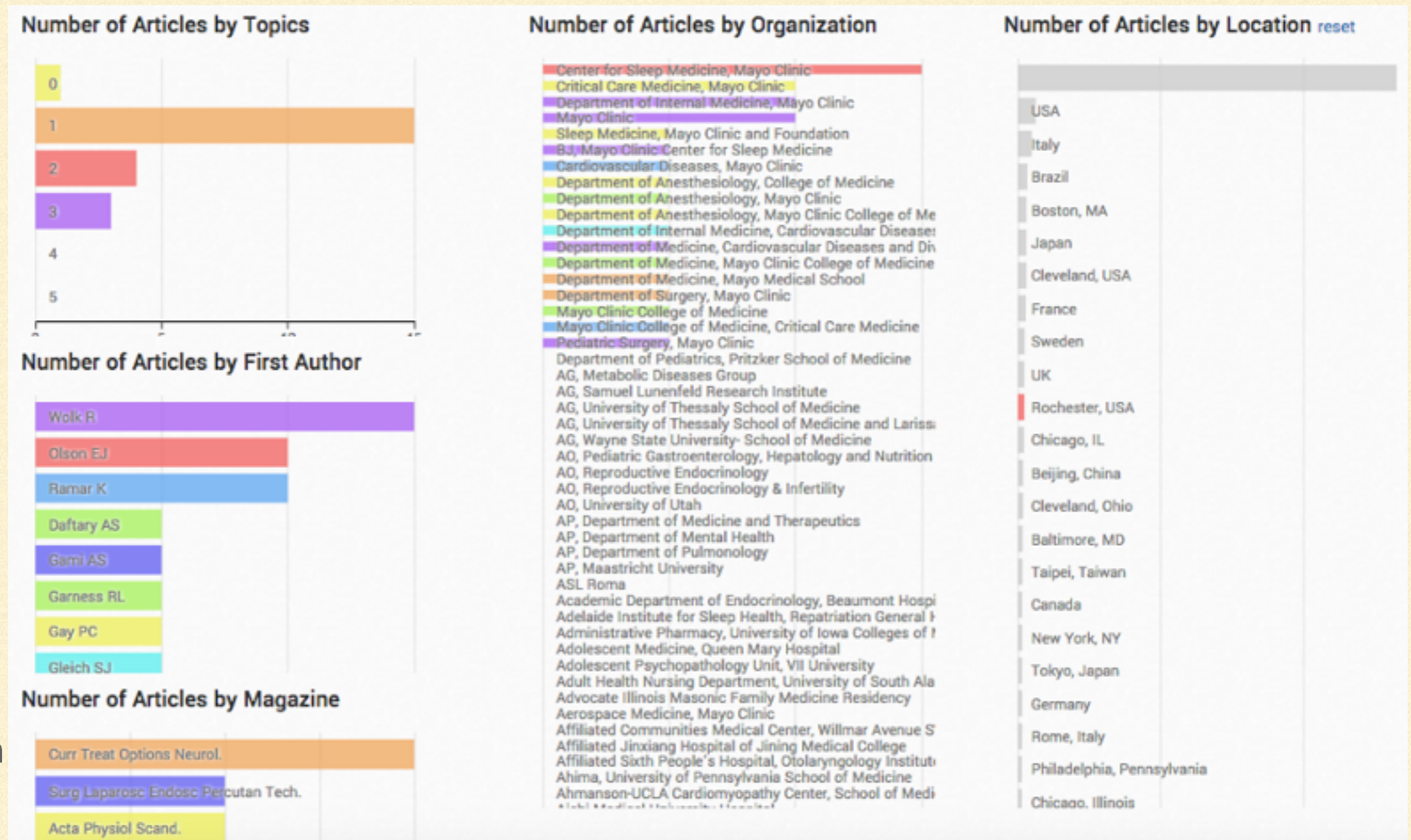
Number of Articles by Location [reset](#)



FINDINGS

Rochester

- Mayo Clinic College of Medicine - most important research organization
- Wolkr R, Olson EJ and Ramar K - experts
- Researches in Rochester focus more on topic I

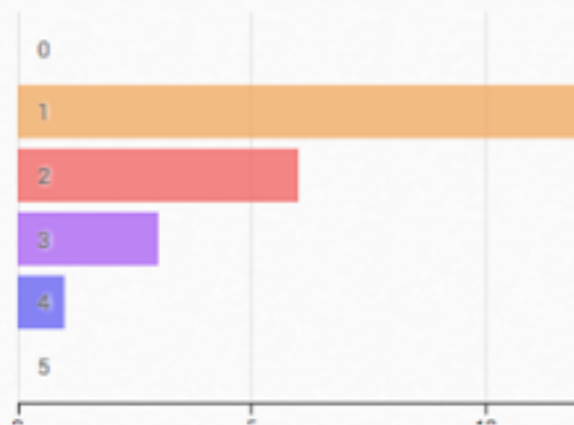


FINDINGS

Chicago

- University of Chicago and Pritzker School of Medicine - most important research organization
- Kim J and Kheirandish-Gozal L - experts
- Researches in Chicago focus more on topic I

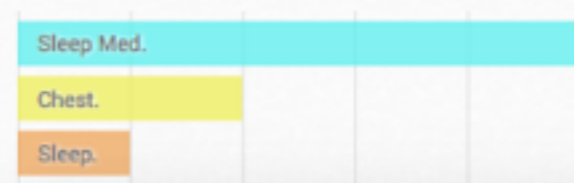
Number of Articles by Topics



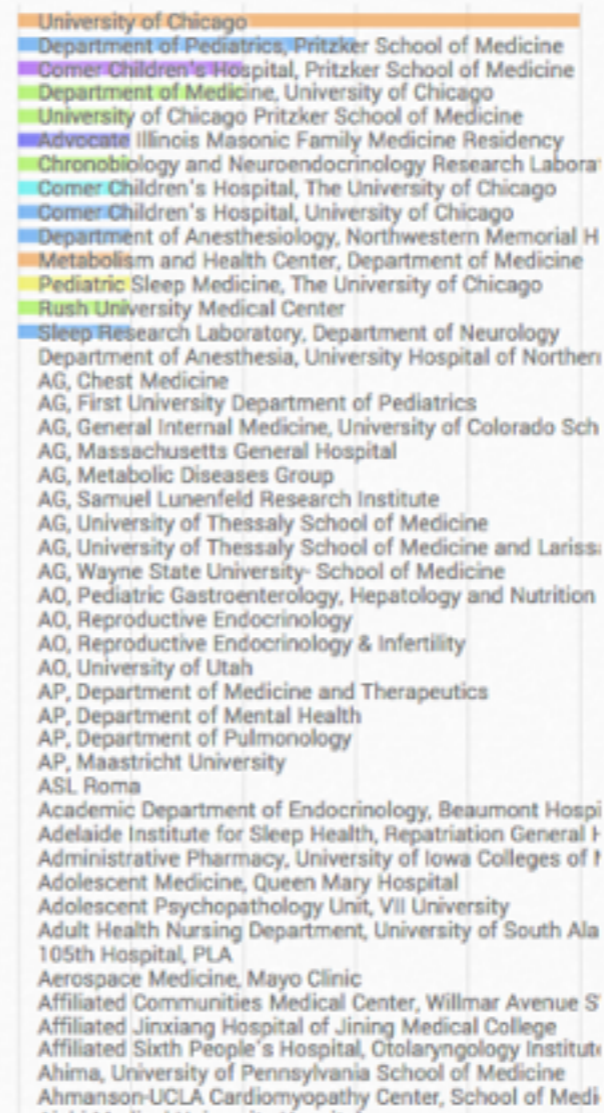
Number of Articles by First Author



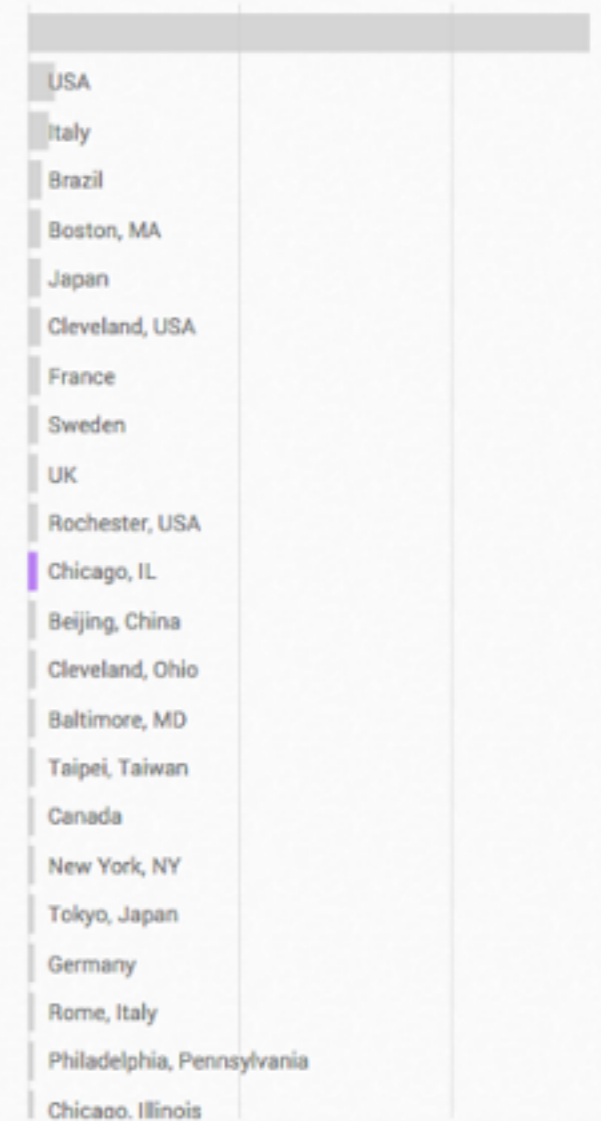
Number of Articles by Magazine



Number of Articles by Organization



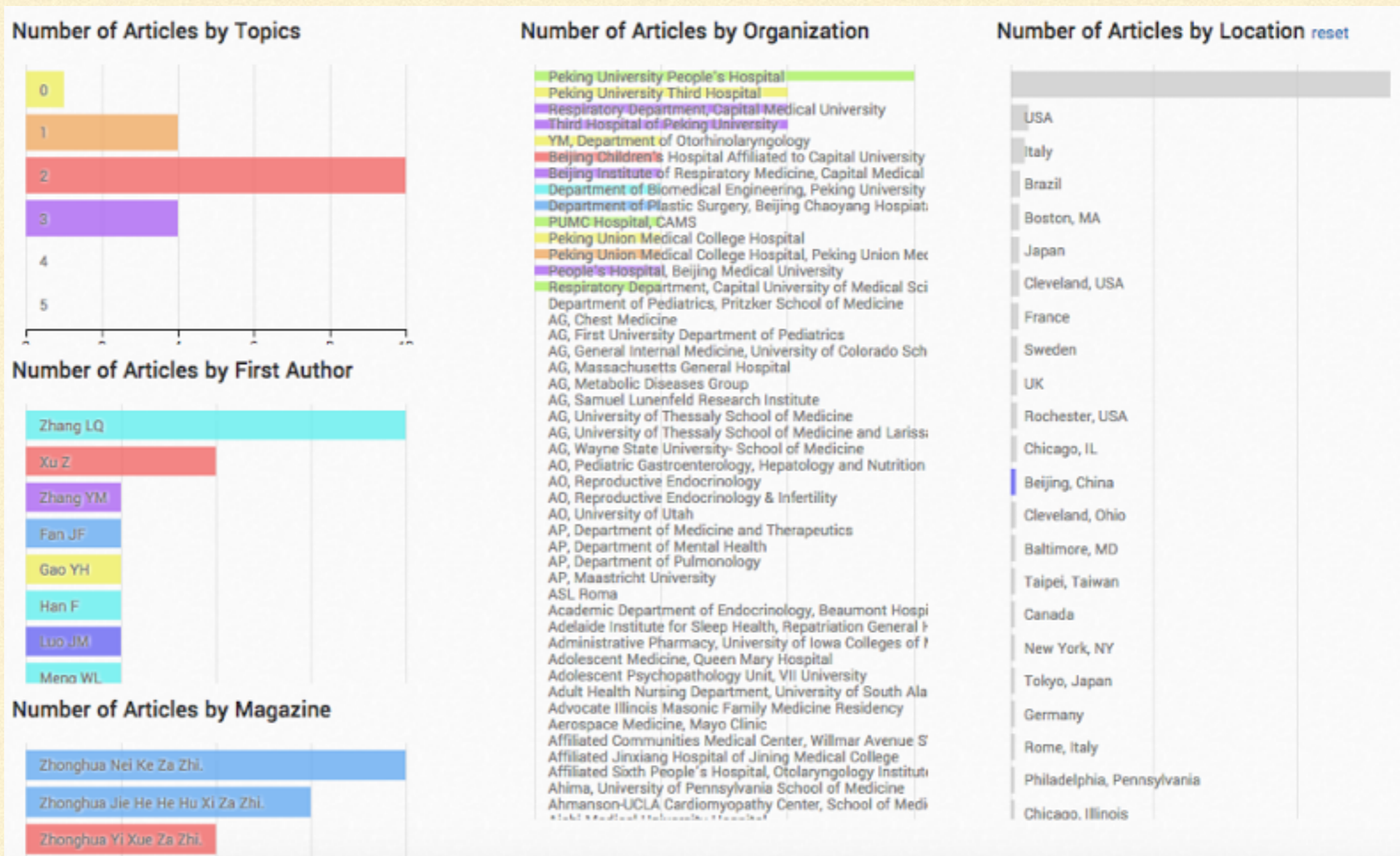
Number of Articles by Location [reset](#)



FINDINGS

Beijing, China

- Peking University People's Hospital and Third Hospital and Capital Medical University - most important research organization
- Zhang LQ and Xu Z - experts
- Researches in Beijing focus more on topic 2 and have almost no research in topic 4 and 5



FINDINGS

1985-2000



- Japan, Finland and Canada was leading countries in this research field during 1985-2000

FINDINGS

2000-2015



- USA, Italy, Brazil, France etc. replaced Japan and Finland during 2000-2015

RECOMMENDATION

- Researchers publishing most paper as first author, publishing most paper and cooperating with most people are not always the same person
 - When invite a research as a consultant, a company should distinguish the value of his/her paper
 - Different organizations and researchers concentrate on certain research domain
 - When choose an institute to cooperate on research about SDB and obesity, a company should pay attention to organizations' and researchers' research domain/topic
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FURTHER IMPROVEMENT

- Merge organization and location with same meaning, e.g. Bethesda, MD and Bethesda, USA
 - Present location with map not bar chart
 - Find a way to load social network for a large dataset faster on webpage
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The End

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