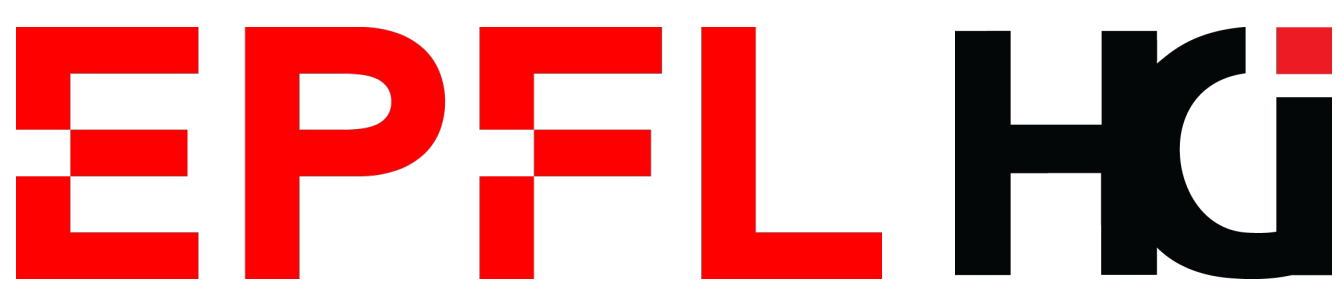


# Machine Reading Comprehension Based Approach to Consumer Health Question Answering

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## Objectives

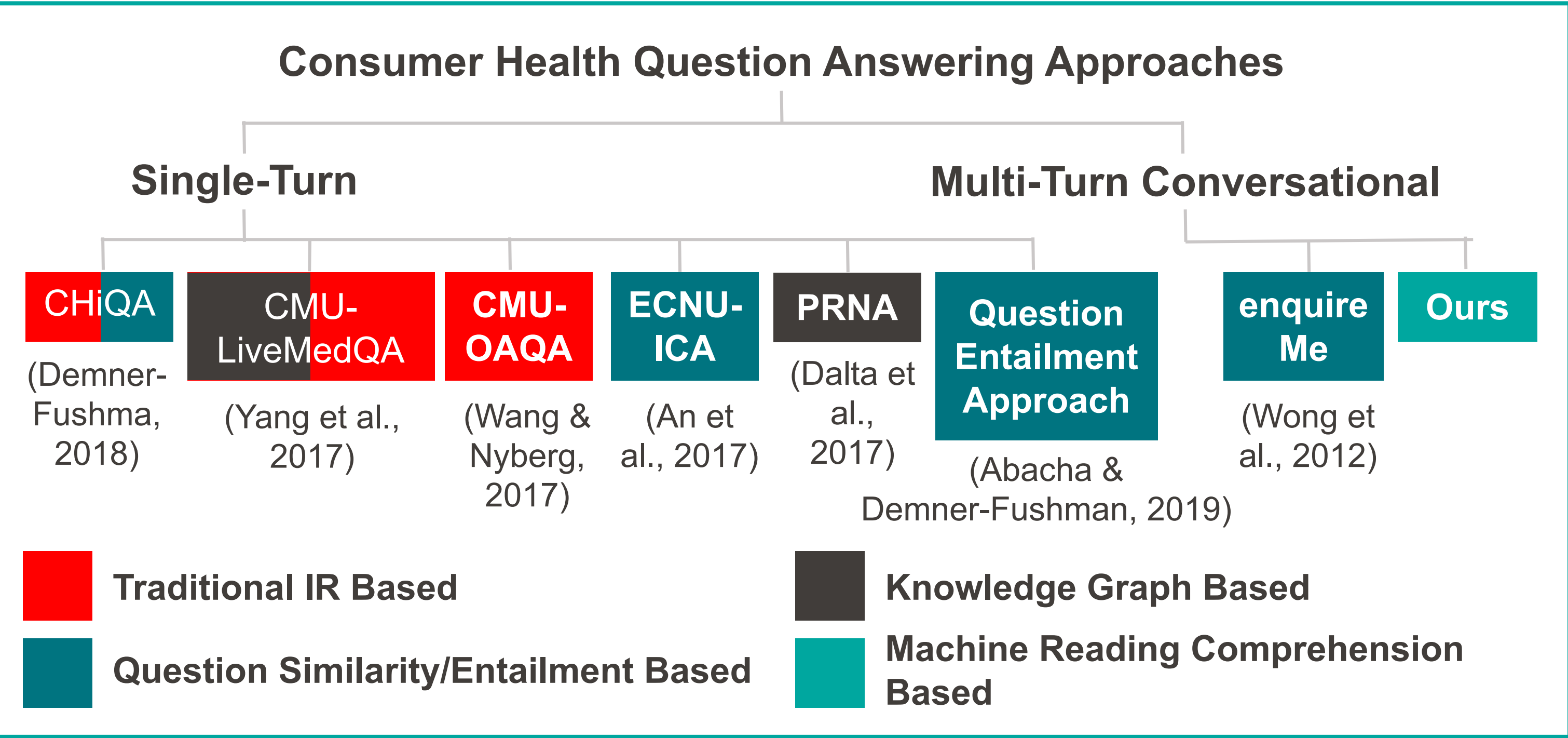
Automated consumer health question answering systems help consumers obtain direct and concise answers to their health related queries. Though there exist many open-domain question answering approaches, which answer mostly open-domain factoid questions, consumer health question answering approaches are relatively rare. Some of the challenges are as follows:

- Queries require long answers that span several paragraphs of text
- Knowledge gap due to specialized jargon used in healthcare
- Unavailability of large-scale consumer health Q&A datasets

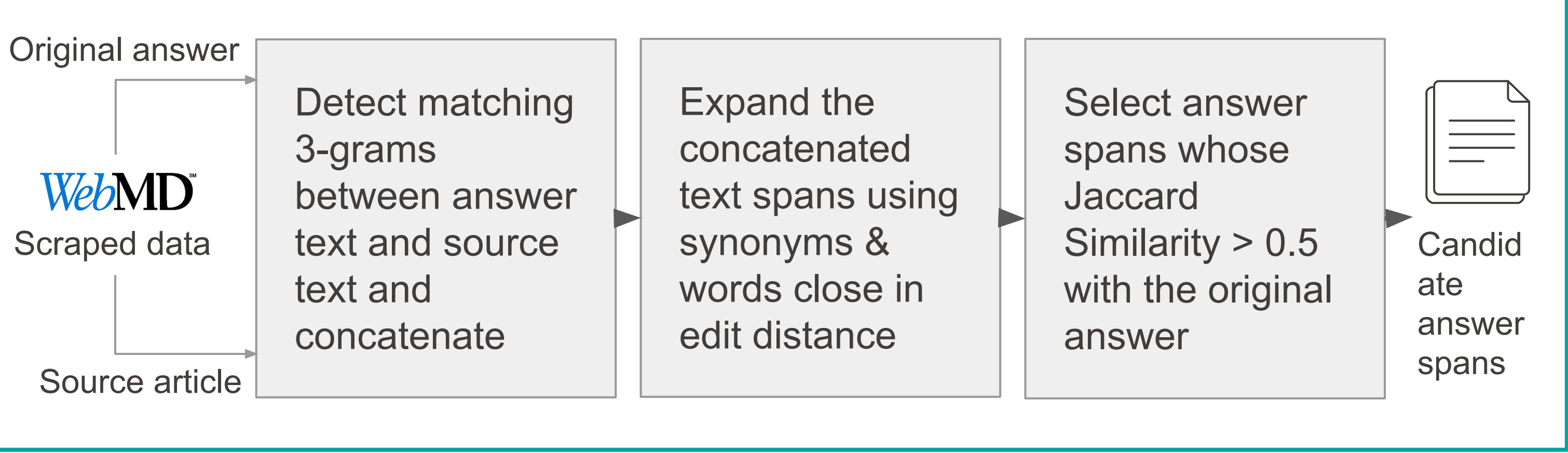
**Solution:**

- We prepare a consumer health Q&A dataset by scraping WebMD such that it can be utilized in automated consumer health question answering.
- We investigate if an existing machine reading comprehension based approach to open-domain factoid question answering, namely DrQA (Chen et al., 2017), can be utilized to answer consumer health questions and show that it is indeed feasible with only a few modifications.

## Related Work

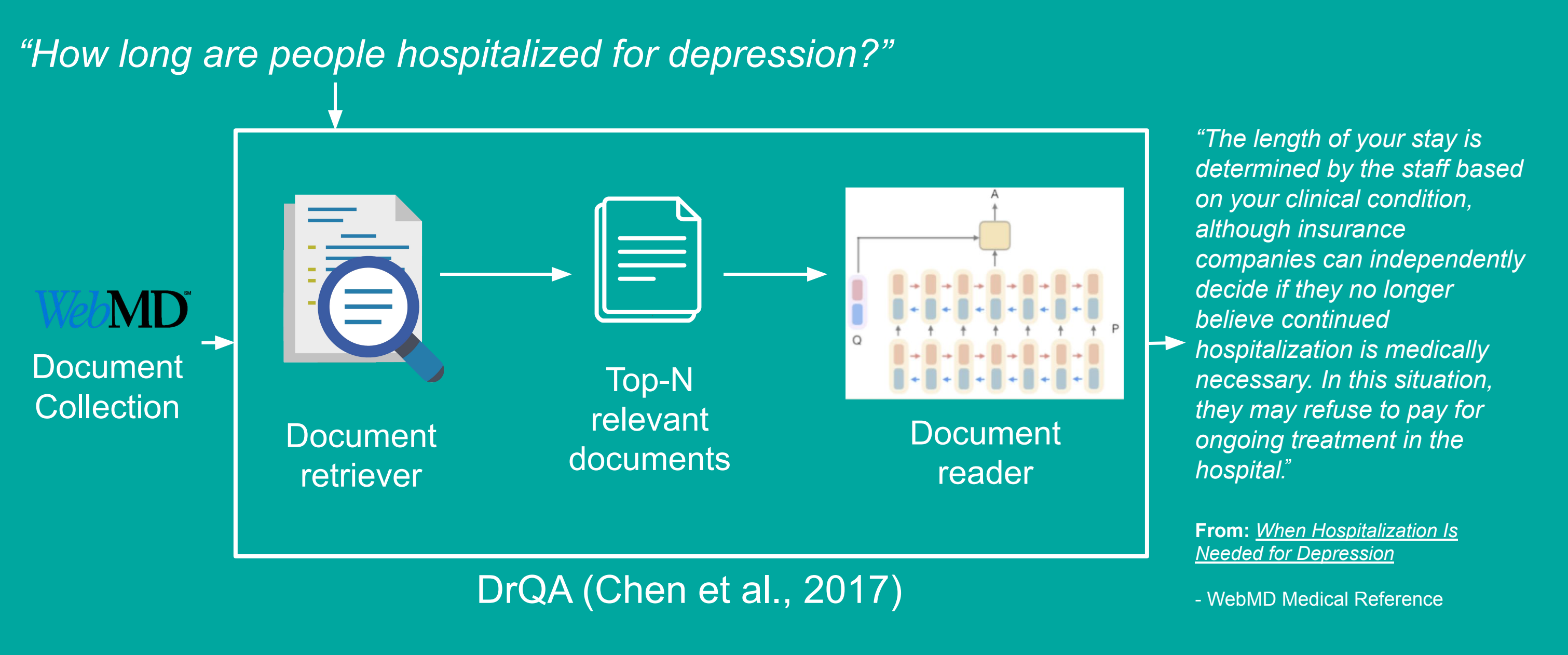


## Data Collection

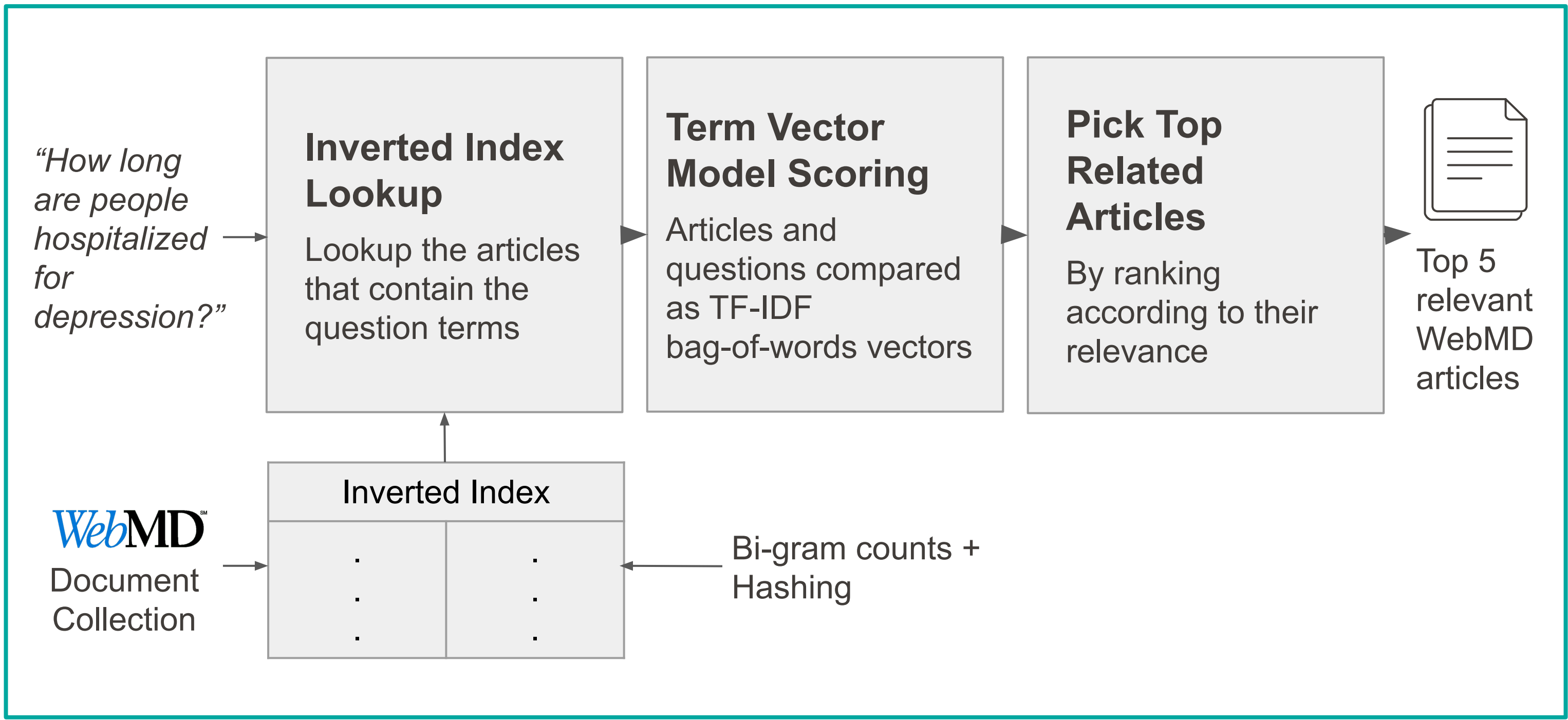


WebMD Q&A Dataset (No. of Q&A Pairs)			Train:Test (9:1)
Initial	After removing duplicates & answers without source articles	After finding matching text spans in source articles	
44,265	38,524	35,715	32,143:3,572

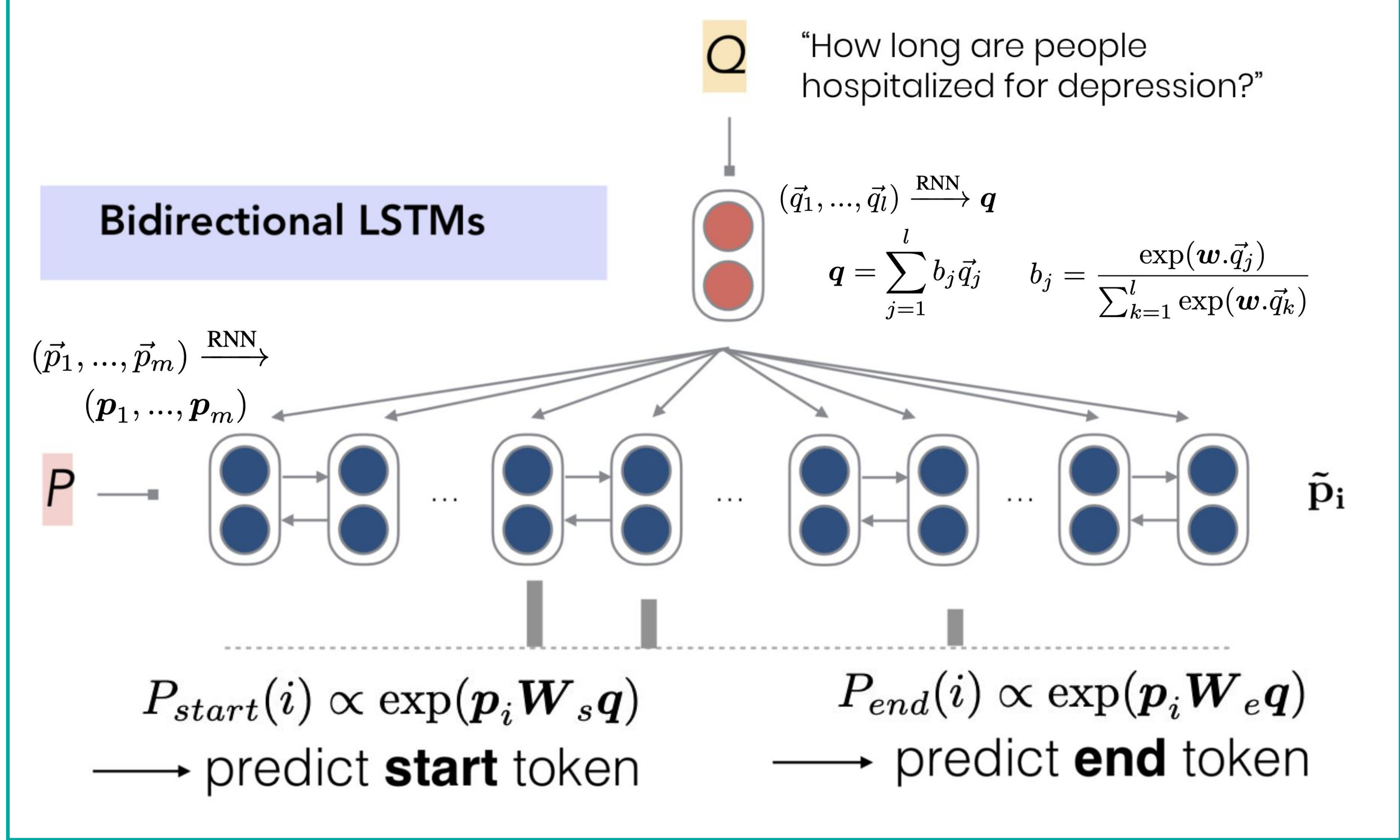
## DrQA Architecture



## Document Retriever



## Document Reader



## Retriever Accuracy

Dataset	Size	Top-5 Accuracy
SQuAD Dev	10,570	77.8%
Curated TREC	694	86.0%
WebQuestions	2,032	74.4%
WikiMovies	9,952	70.3%
WebMD Test	3,572	74.0%

## Reader Performance

Dataset	Size	F1-score
SQuAD Dev	10,570	78.8
SQuAD Test	694	79.0
WebMD Test	3,572	75.6

## Example Q&A

Q: What is Effexor?

A: “Venlafaxine (Effexor and Effexor XR) is a newer antidepressant that boosts the levels of norepinephrine and serotonin in the brain. It helps improve mood and concentration.”

Q: How to prevent acne?

A: “Almost everyone has had at least mild acne at some point. Acne is the most common of all skin disorders, affecting some 40-50 million Americans. A generation or so ago, it was thought that eating too many sweet or greasy foods cause acne; now doctors know much more about why breakouts happen and how to treat.”

Q: I wish my facial skin was clear

A: “Keep your hair off your face, neck, or other pimple-prone areas. Oil and dirt from your hair can block pores. If you want to wear your hair longer, make sure you keep it clean”