

# Web Search Engine and Virtual Assistant Derived Health Information About Pre-Exposure Prophylaxis (PrEP) for Human Immunodeficiency Virus (HIV) Prevention in Adolescents and Young Adults (AYA)



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## Background

- AYA are disproportionately affected by HIV and often seek health information online.
- PrEP, when taken as prescribed, reduces risk of HIV infection and should aim to include AYA to reduce HIV incidence in this population.

## Objective

- To determine whether reliable and accurate PrEP information can be found using web search engines and virtual assistants.
- To assess readability (reading grade level) of results.

## Methods

- Adolescent health experts developed a list of 23 common questions AYA have about PrEP that were assigned to PrEP Basics (general information), PrEP Access (youth access), and PrEP Use (Rx & instructions) categories.
- Questions were posed to (1) search engines: Ask.com, Bing, Google, and Yahoo and (2) virtual assistants: Amazon Alexa, Microsoft Cortana, Google Assistant, and Apple Siri on separate days in March 2021.
- First three results were recorded and coded using a six-tier PrEP Information Quality Scale.
- Readability of results was determined using the Flesch-Kincaid Grade Level Scale through an online web-tool.

## Results

**Table 1. PrEP Internet Search Questions**

Question	Category
What is PrEP?	Basics
What kinds of PrEP are available?	Basics
What is Truvada?	Basics
What is Descovy?	Basics
What is the difference between and Truvada and Descovy?	Basics
Does PrEP protect against other sexually transmitted infections (STIs) / sexually transmitted diseases (STDs)?	Basics
Should I take PrEP?	Basics
What are the side effects of taking PrEP?	Basics, Use
Will PrEP make me feel sick?	Basics
How does PrEP work?	Basics, Use
What is the difference between PEP and PrEP?	Access
How effective is PrEP?	Access
Where can I find PrEP?	Access
How can I get PrEP?	Access
Do I need insurance to get PrEP?	Access
Do I need my parents' permission to get PrEP?	Access
Will my parents know that I'm using PrEP if I'm on their insurance?	Access
How much does PrEP cost?	Access
How do I take PrEP?	Use
When can I stop taking PrEP?	Use
How long does it take for PrEP to start working?	Use
What happens if I miss a dose of PrEP?	Use, Basics
How do I refill my PrEP prescription?	Use, Access

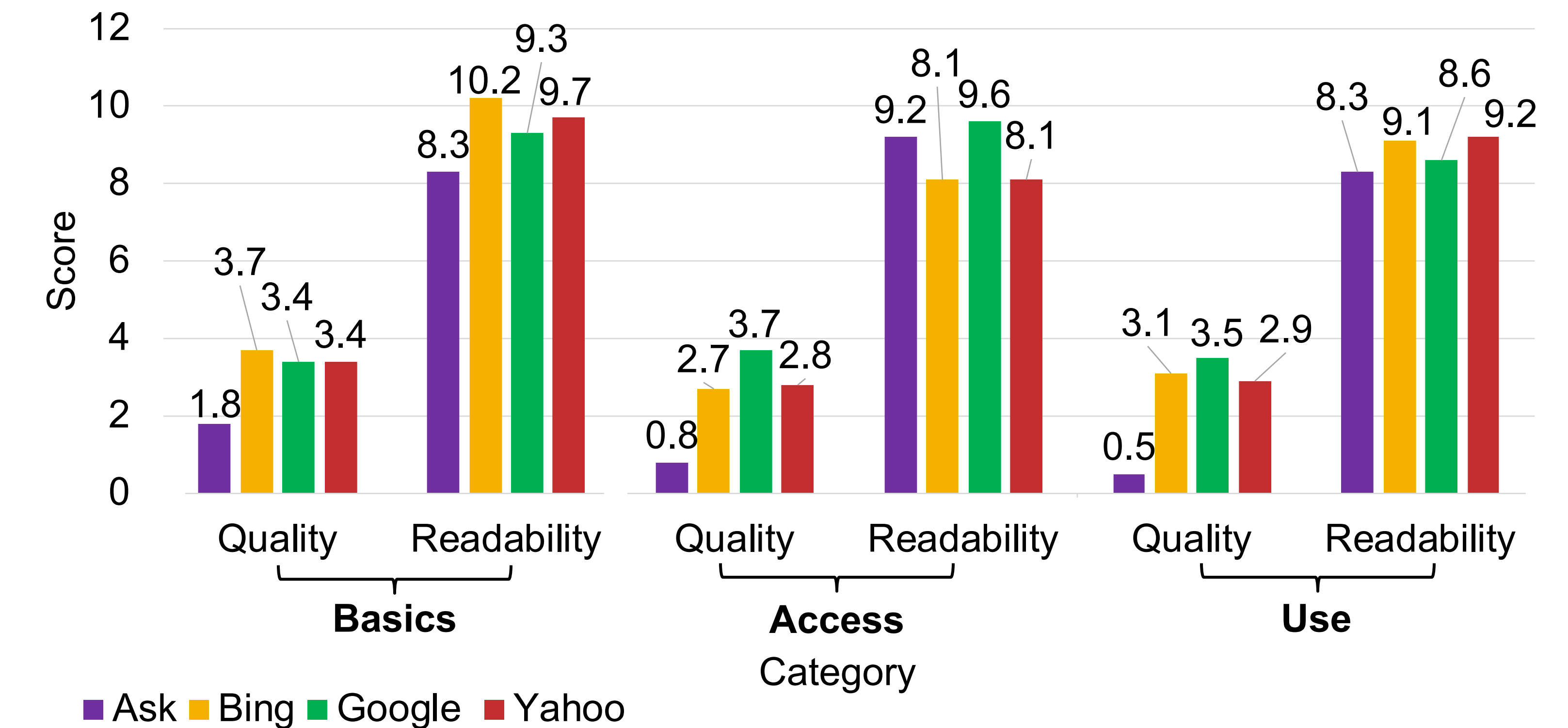
### Information Quality (Range 0-5)

- Google search engine and Google Assistant more frequently produced higher quality PrEP information.

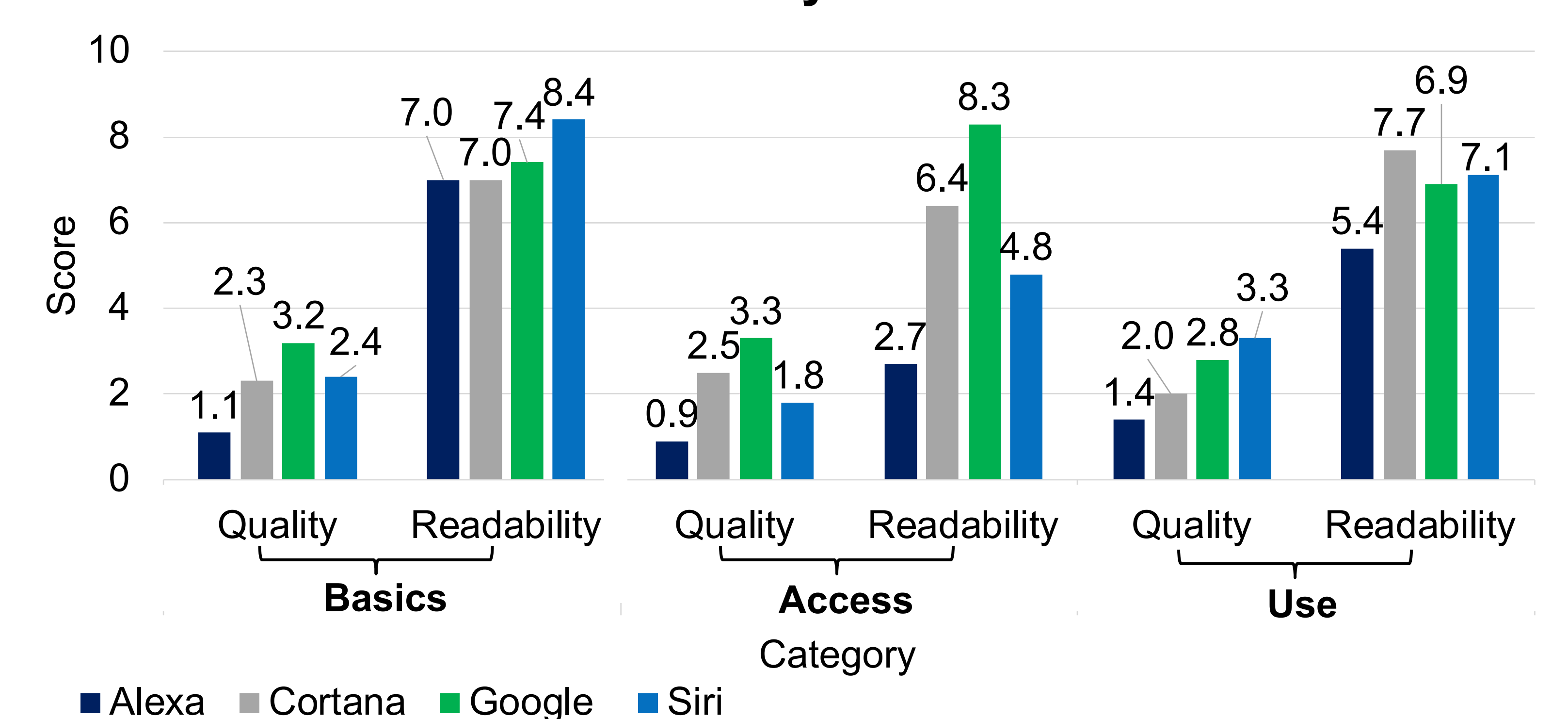
### Readability

- Scores calculation: Grade Level = 0.37 (words/sentence) + 5.84 (syllables/word) – 15.59
- Results often presented in language between seventh and tenth-grade reading levels.

**Figure 1: Search Engine Information Quality & Readability Scores**



**Figure 2: Virtual Assistants Information Quality & Readability Scores**



## Limitations

- This study was conducted only in English and may not generalize to individuals with limited English proficiency.
- Virtual assistants occasionally misunderstood question posed and could not differentiate PrEP from other types of "prep" since "HIV" was not included in searches.

## Conclusions

- PrEP information from online searches was highly variable between the search engines and virtual assistants.
- It is important that the information AYA receive about HIV prevention methods is informative and comprehensible.
- Future studies should include AYA perspectives on what questions they would ask in addition to provider opinions.