

The Pursuit of Health Knowledge

Presenters:

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HINTS5 Dataset

BACKGROUND:

- Research conducted by the U.S. National Cancer Institute (NCI)
- Every few years to civilian, non-institutionalized adults in the U.S.

SUMMARY:

- 5247 completed questionnaires and 191 partially completed questionnaires.
- 5438 rows
- 730 features (columns)

To learn about U.S. adults' cancer-related perceptions and knowledge, their health behaviors and their health-related information access, needs, seeking and use.

Approach

Step 1

Read the documentation

- 7 different documents explaining the methodology, webpilot results, and annotated Instrument details.

Step 2

Data Preprocessing

- Removed 371 columns (NCI weighted scale) - not the focus of this work
- Removed all values representing missing values (-9,-7,-5)
- Removed non-numeric values (Eg: explanation for 'if others' field.)

Step 3

Analysis

Dimensionality Reduction

- Reduced similar values to one group in multi-valued features.
Eg: Age, Agree/Disagree scale, Daily/ Never scale, Always/Never scale.

Data Exploration techniques and Machine Learning Models

- Used different classification and regression models.
 - Determine the correlation between the features.
 - Explored the dataset to extract interesting features using different statistical methods.
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Area of Interest

- How we can use this dataset to extract information about health-related behaviour and how we can make it better.
 - Can we predict human health behaviour?
 - Can we improve health related information seeking behaviour - where and how?
 - Understand the Influence of social and economic factors on health-related behaviour
 - Use the understanding towards sustainability in Health sector
- Why?
- Healthy society is sustainable society.
 - Resources in health sector are under-utilized.
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Pillars of Sustainability?

- **Social Aspect**

- Do they seek information?
- Where they seek information?
- Influence of electronic devices and social media?
- Are they happy about it?

- **Economic Aspect**

- Does income influence the health behaviour?
- Is there any other aspects of economics.

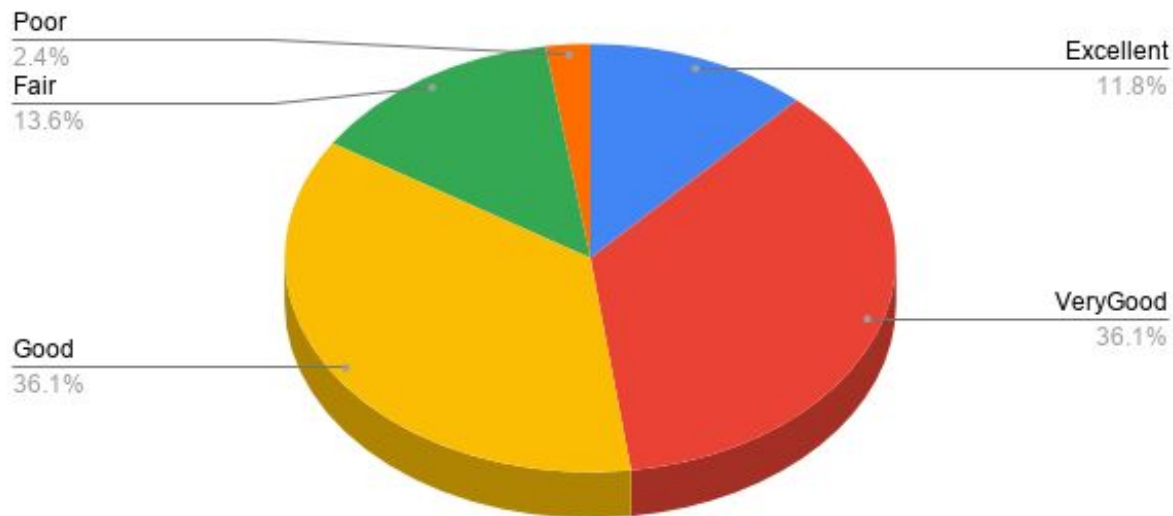
- **Environmental Aspect**

- Dataset did not have features to tell about this aspect
 - What could have been useful?
 - Carbon footprint of health institution/ locality.
 - Pollution level - water, air quality
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People's' Opinion about their health and its influence on health behaviour

What people think about their health?

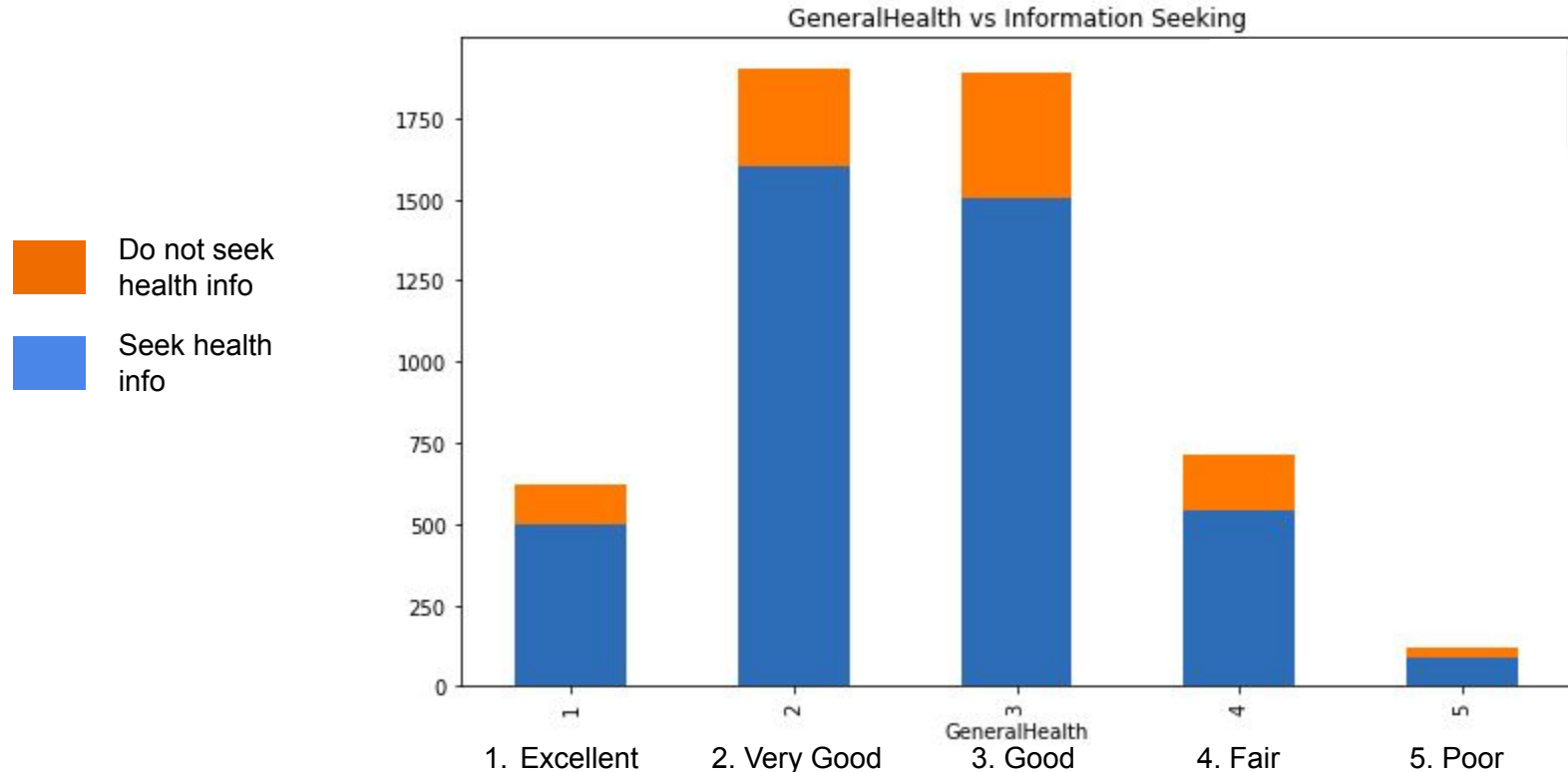
General Health opinion of the people



Observation:

- Majority of the people think that they have **Very Good** or **Good** health.
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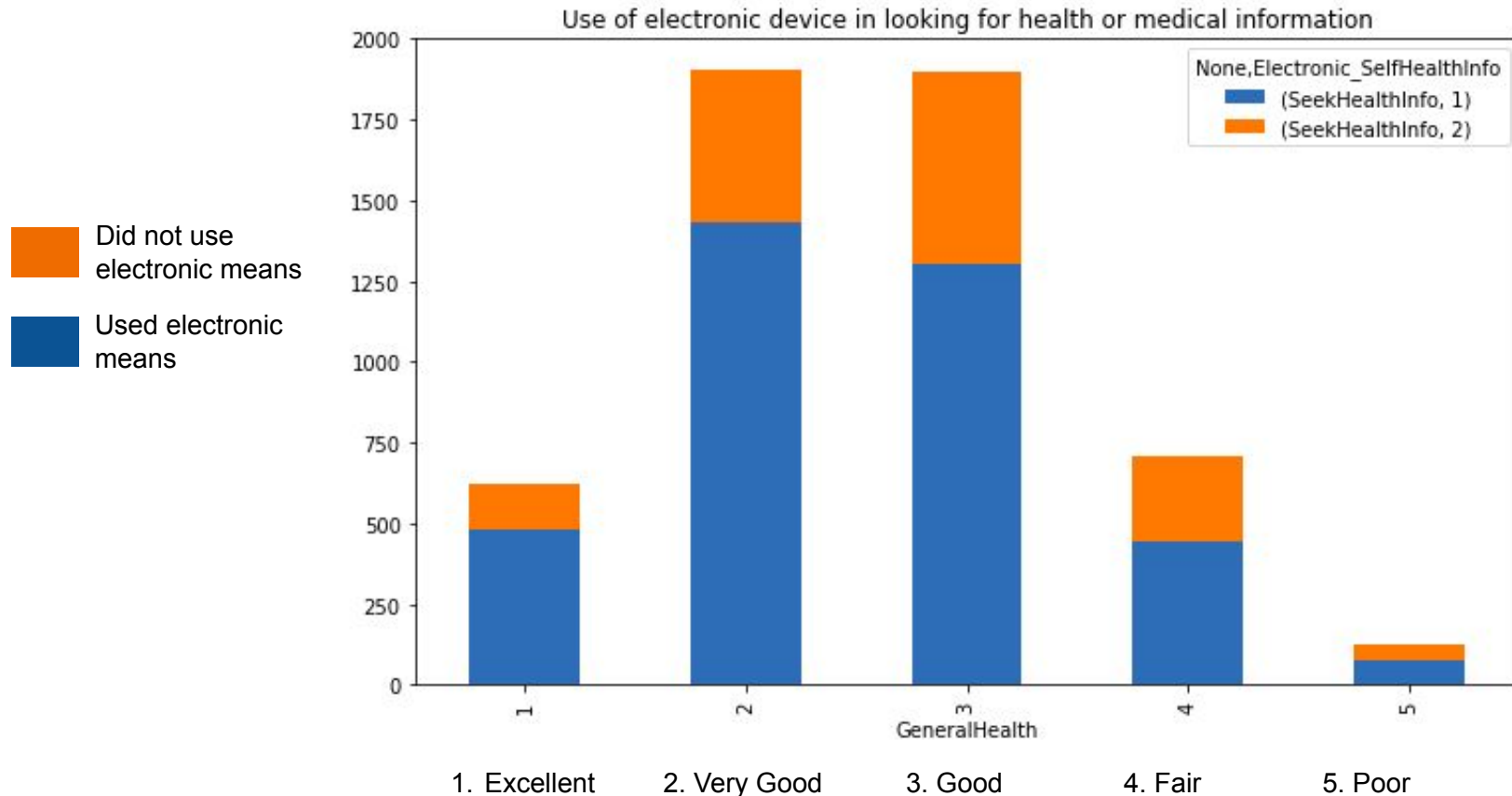
Do people seek health information?



Observation:

- Overall, about 22% of people do not seek health-related information no matter what they feel about their health.
 - 28% of the people who feel that they have Poor health don't seek health information. Reason? - Income?
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Do people use electronic means to look for health information? - [In past 12 months]

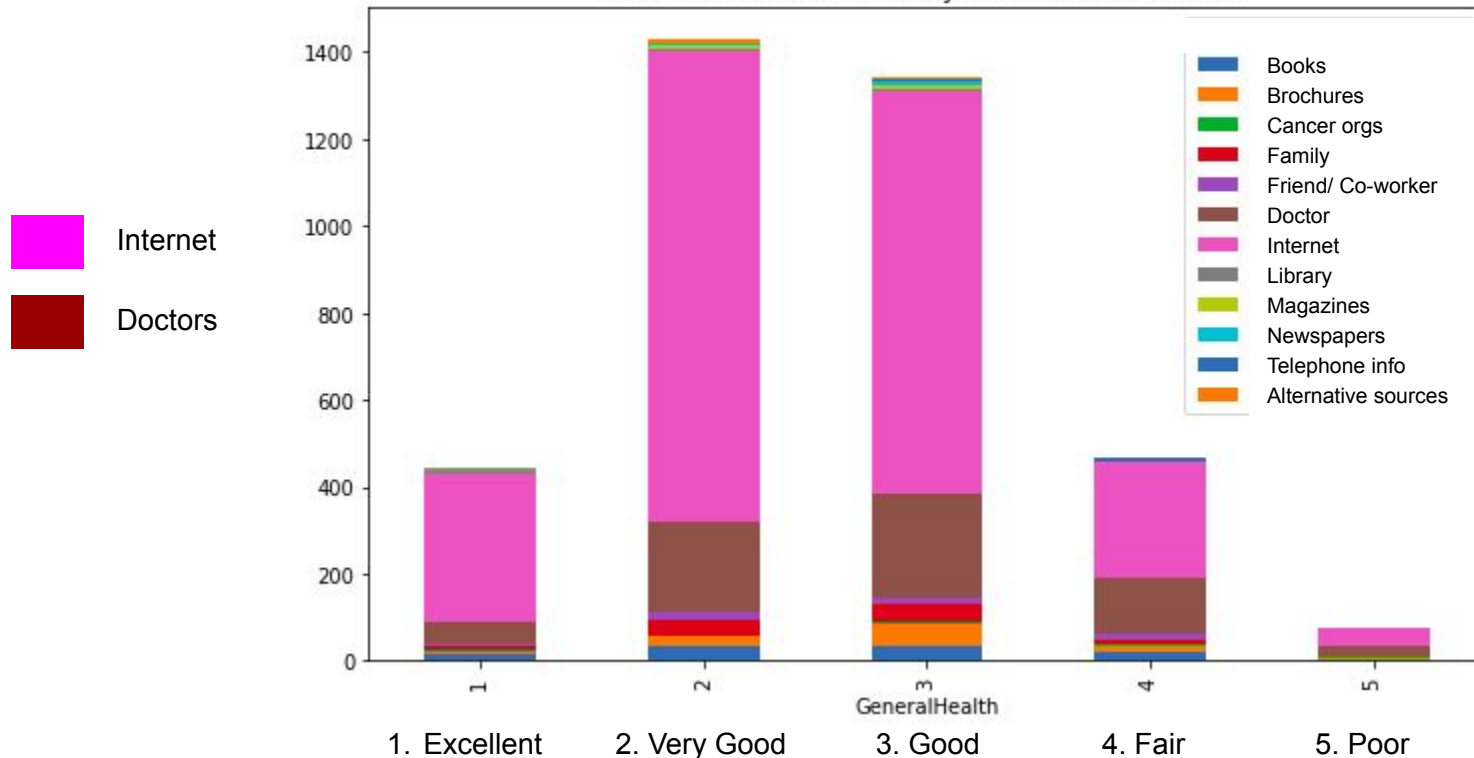


Observation:

- Most people have used electronic means to look for health or medical information for themselves.

Where do they seek information - Generally?

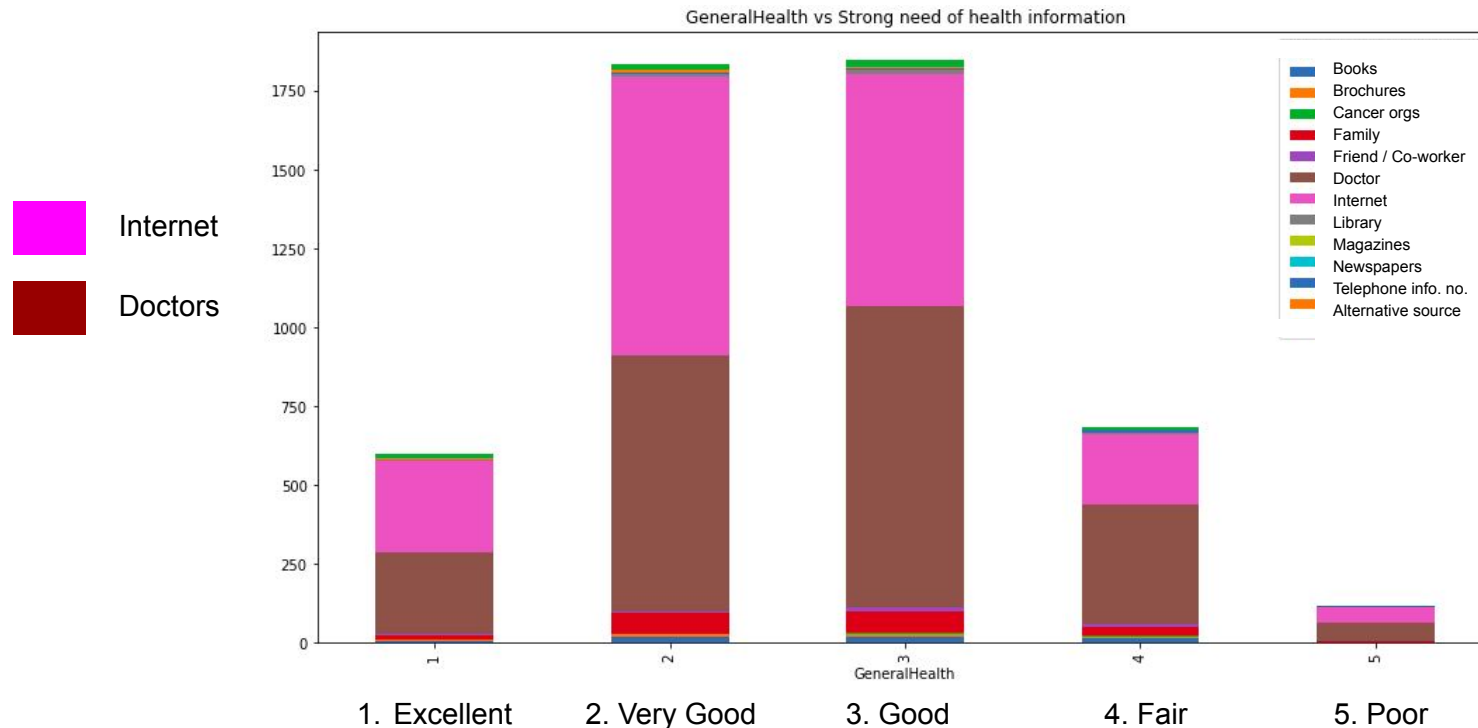
GeneralHealth vs Where they seek health information



Observation:

- In general, people usually look into the **Internet** for health information more than they visit the **Doctors and other health workers**.
- **Mostly used devices:** Mobile devices
- **Location of internet usage:** Workplace (internet usage)

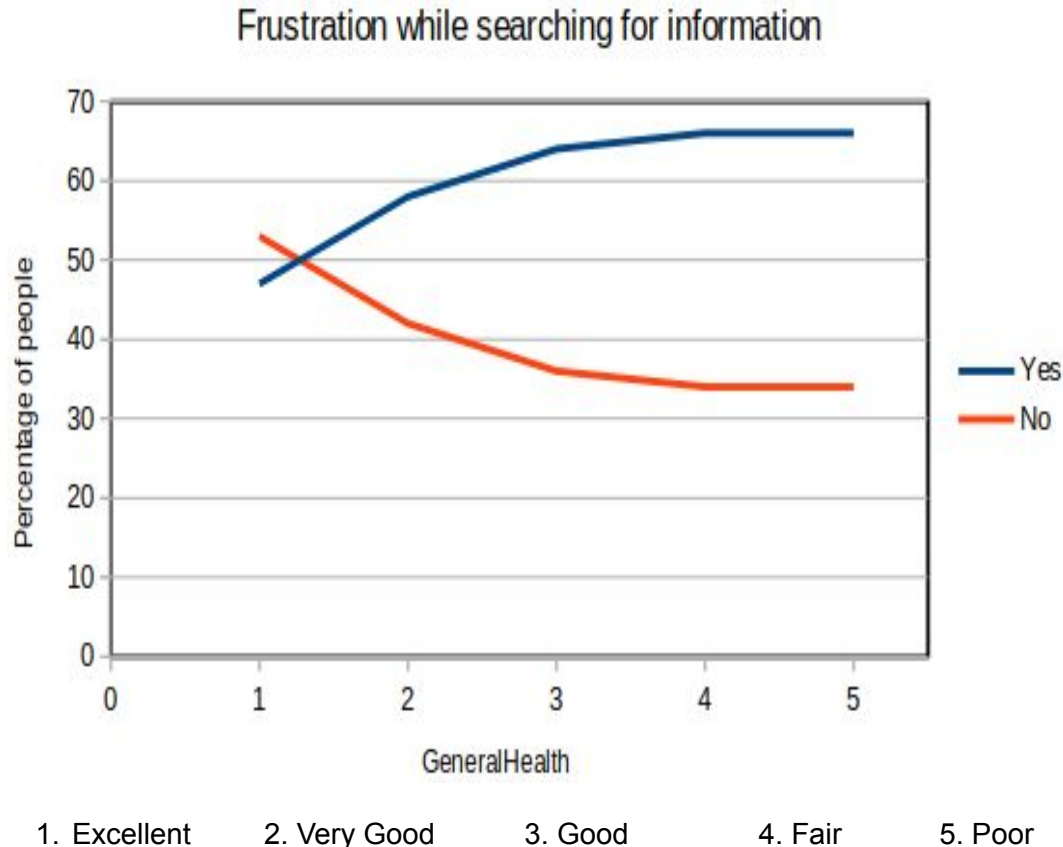
Where - when in strong need of health info?



Observation:

- But, when it comes to critical or strong need to get health information, they trust **Doctors and other health workers** more than **Internet**.
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Do they feel frustrated when looking for health related information?



Observation:

- Almost 47% of people who think they have excellent health(1) were frustrated.
- The frustration gradually increases as the general health gradually decreases. The same goes for lots of effort.

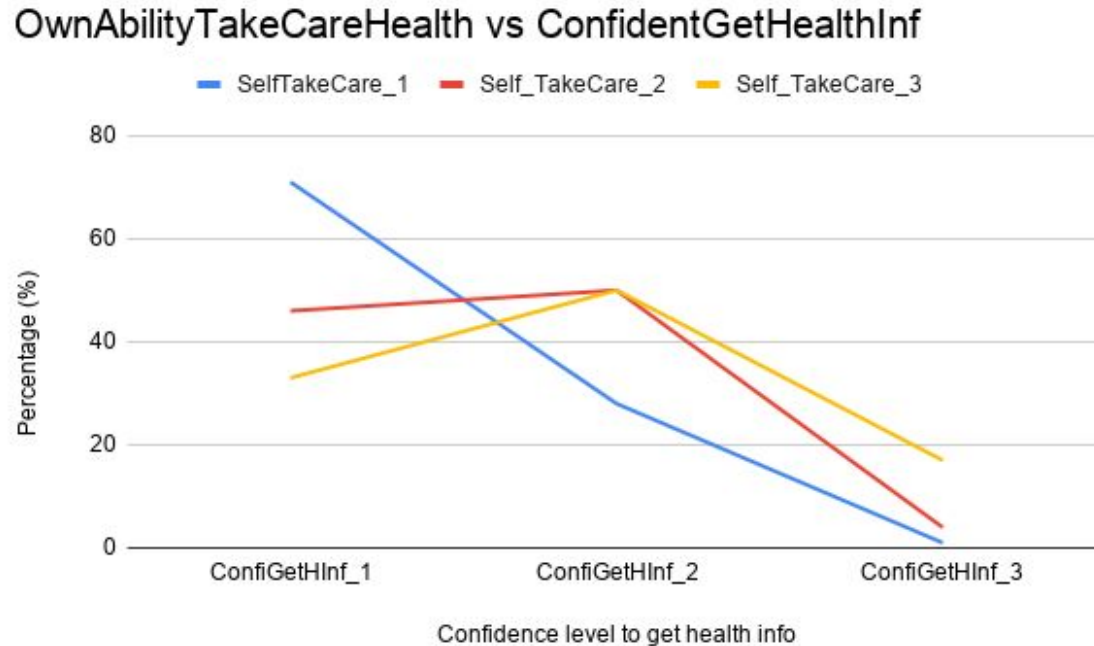
Major source of frustration:

Telephone information

Recommendation:

- Using chat bots
 - Health index ranking of web information.
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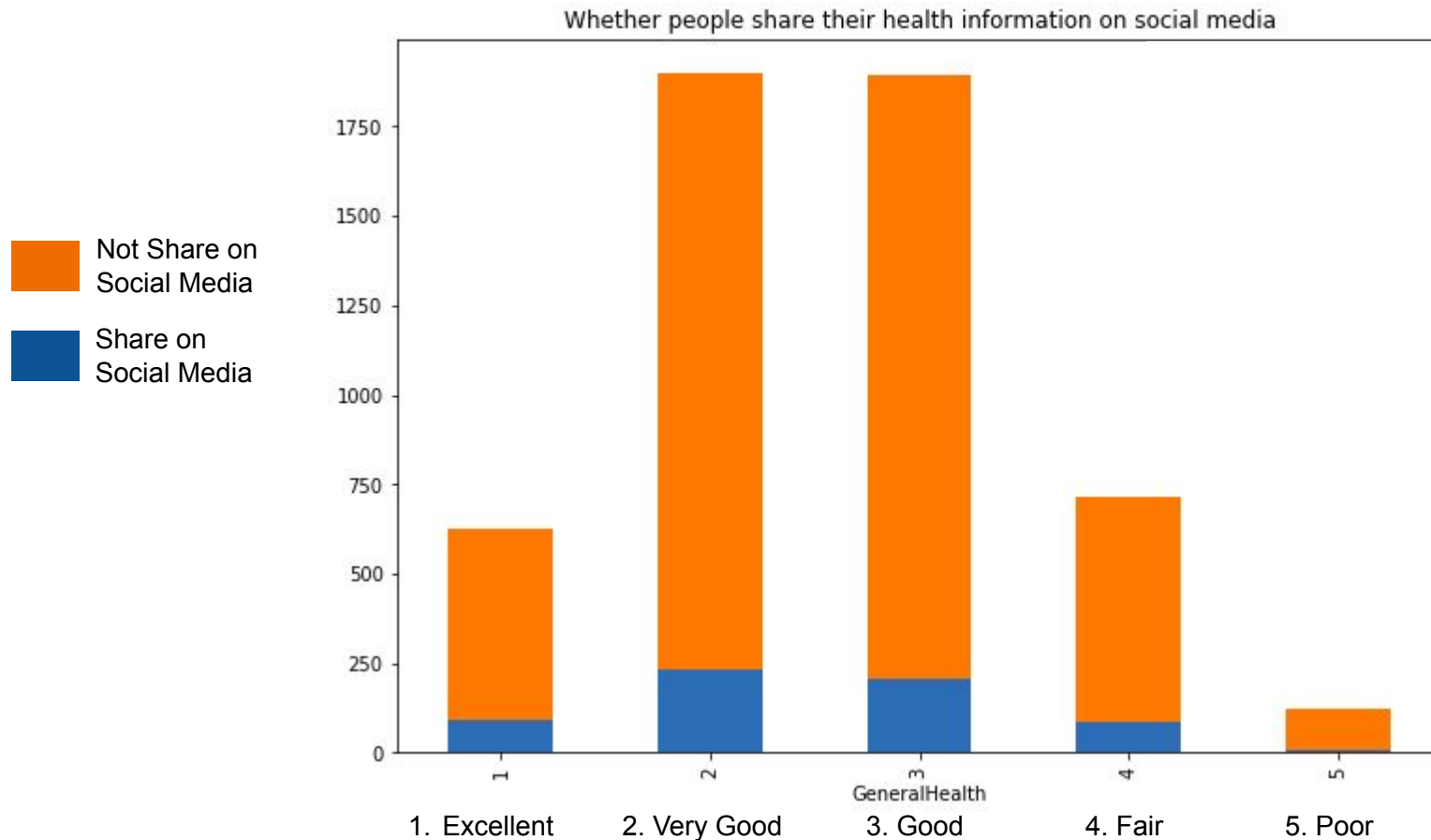
Does Own Ability to Take Care of their Health matters?



Observation: - Yes. It does!!!

- Ability to take care goes down -> confidence to get health information goes down.
 - How do we increase self-efficacy?
 - Find better ways to point out reliable source. [Reliability index]
 - Encouraging peer-groups and discussion groups.
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Do they like sharing health related information on Social Media?



Observation:

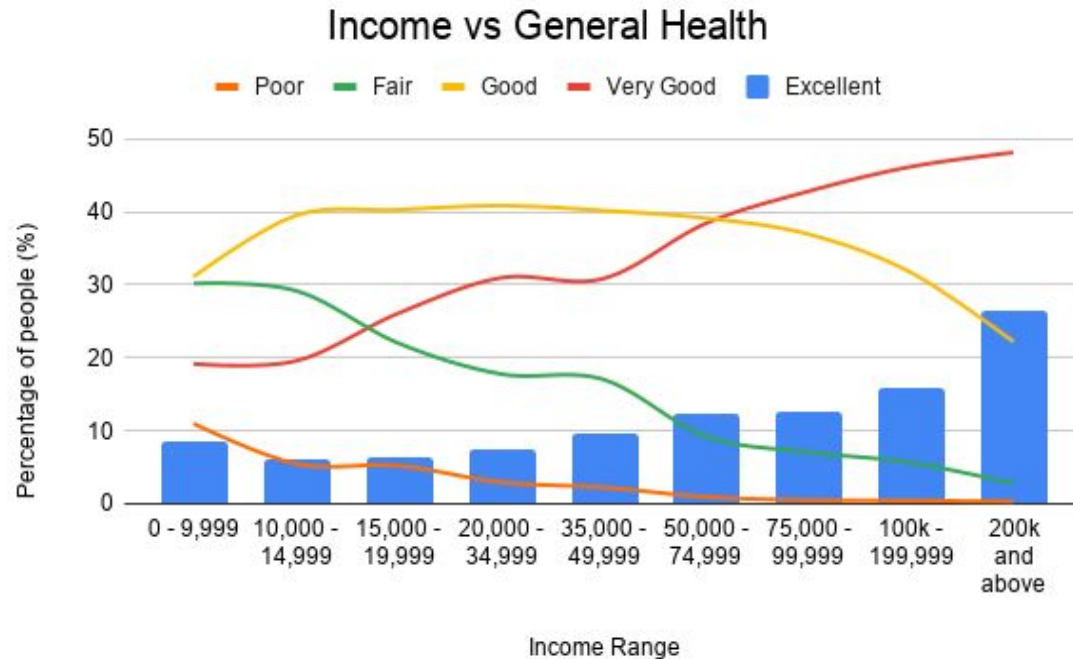
- Very few people like to share their health related information on social media, no matter what they feel about their health.
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Analysis based on Observation:

- Most of the people believe that they have **good health in general**. This means that they don't have any diseases that they know of.
 - People still **trust doctors** and other health care workers no matter how advanced the internet or technology has become.
 - **Looking for health related information in workplace** means that people, in general, don't like to share their health issues even with their family members. Majority of the day is spent at work.
 - People try to get health related information on their own. But the information available makes it **difficult to filter out the relevant and reliable sources**.
 - **Self efficacy matters** when it comes to **health related information seeking**.
 - People love using social media platform for different purposes but sharing **personal health information** is not among them.
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Economic Aspects of Health Seeking Behavior

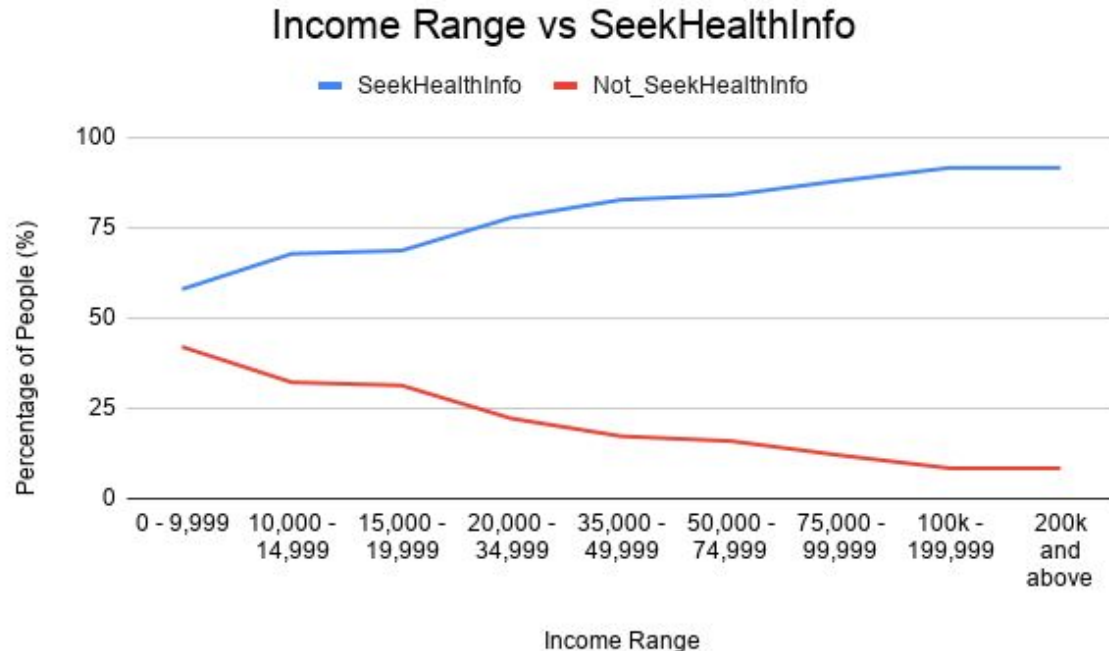
Does Income affects General Health opinion?



Observation: - Yes. It does!!!

- The percentage of people who reported **Excellent** and **Very Good** health increased with the increase in income.
 - Reasons
 - Higher self confidences and better access to health care and treatment.
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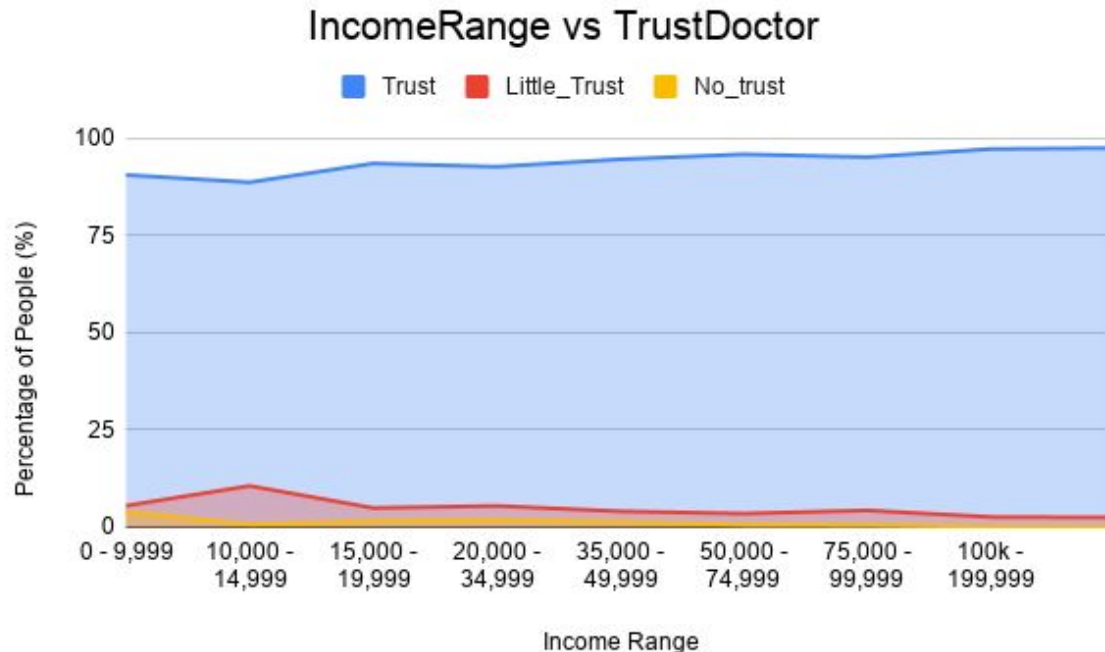
Does Income affects Health Information seeking?



Observation: - Yes. It does!!!

- Higher the income -> Higher their desire to seek health related information.
 - Reasons
 - Better access to health care
 - Education
-

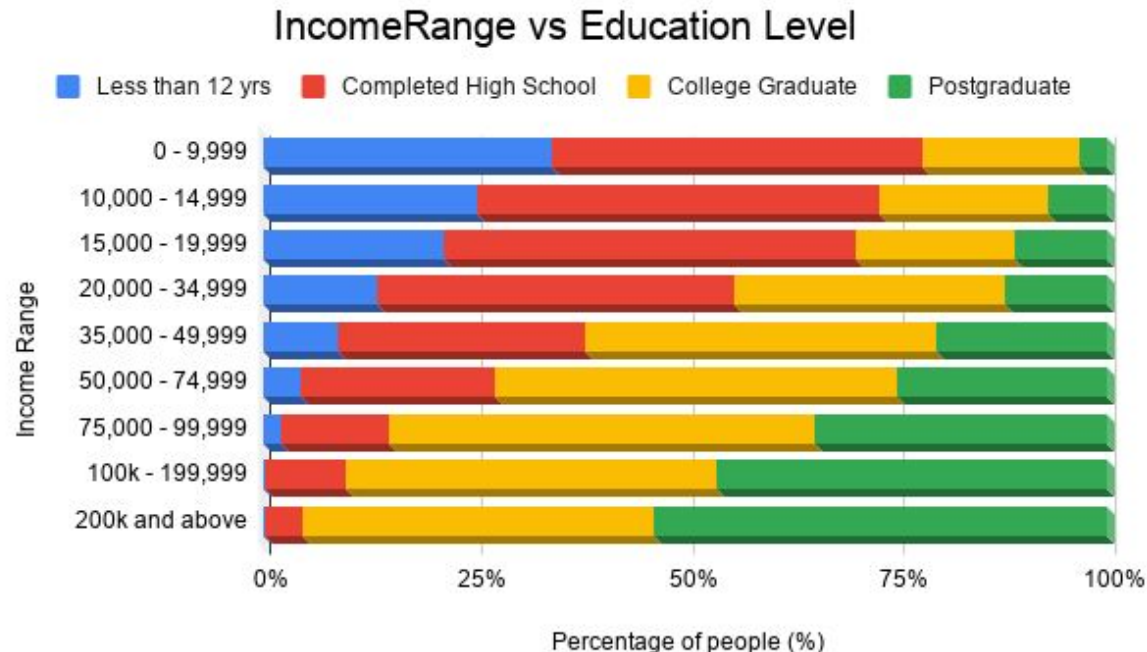
Does Income affects People's Trust in Doctor for Health related Information?



Observation: - Yes. It does!!!

- Trust in doctor increases slightly as the income range increases.
 - Income Range **10,000 - 14,999** is an **anomaly**.
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Reason? - Education Level



Observation:

- As income range increases, people value education more and more.
 - This likely makes people aware that Health Workers/Doctors are well equipped and knowledgeable than Religious orgs in terms of health related information.
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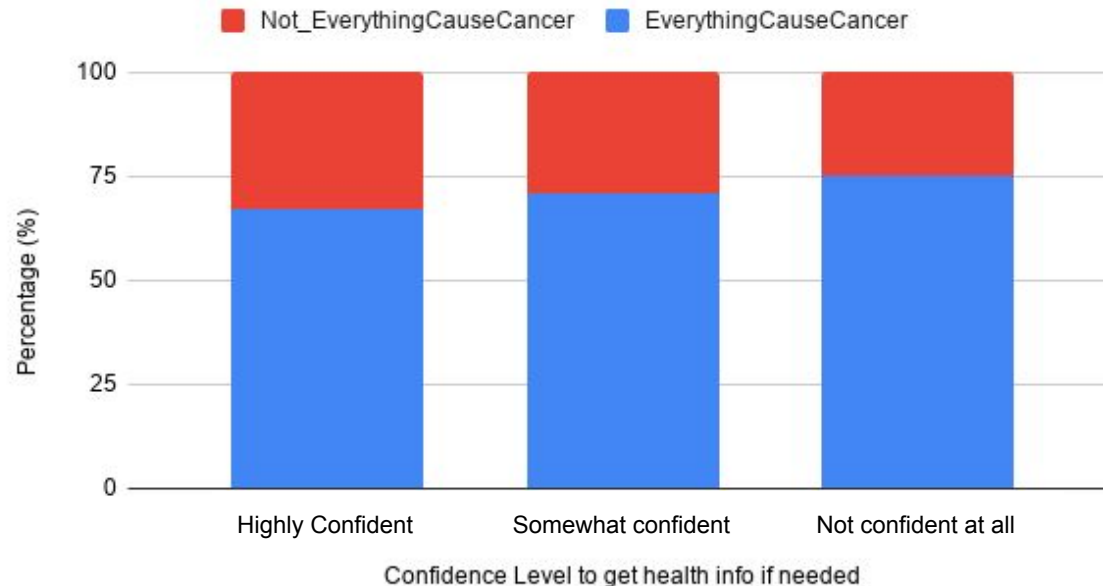
Analysis based on Observation:

- Person's **income influences their health related behaviour** and information seeking.
 - People with **higher income believe that they have better health**. This might be because people with higher income can spend more on health care and do regular health check-ups.
 - People with higher income tend to seek more health related information. The likely reason is the higher self-esteem and belief that they can achieve a positive outcome by an informed action.
 - Higher income family/individuals spend more money on health care and hence seek health treatments from qualified health workers.
 - **Income and Education level are correlated**. As one increases so does the other.
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Analysis of Cancer

Does Everything Cause Cancer?

ConfidentGetHealthInf vs EverythingCauseCancer

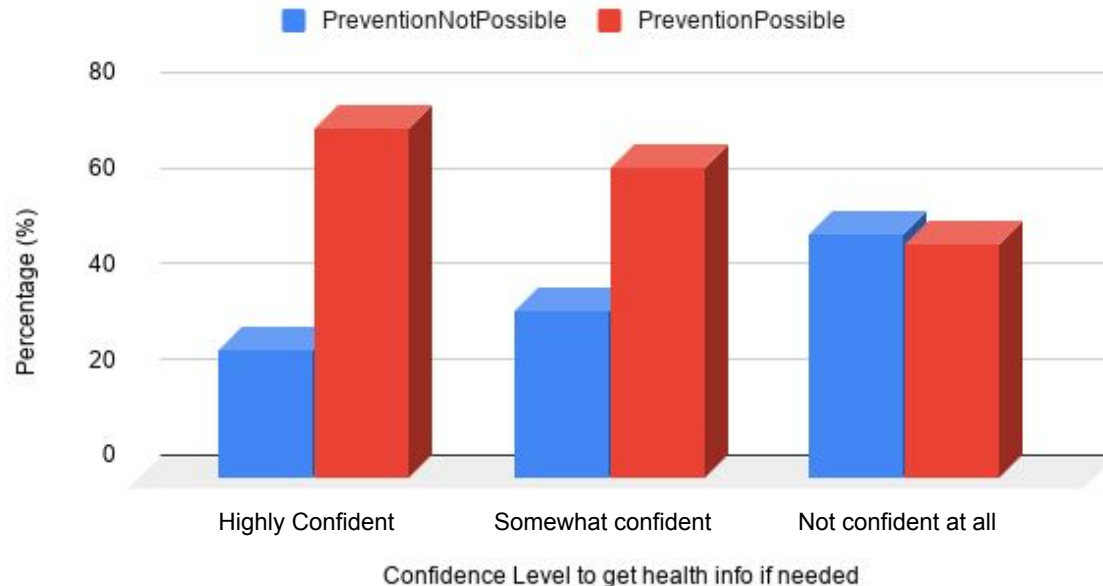


Observation:

- People who are less confident about whether they can get health related information in need are more likely to believe that everything causes cancer.
 - Once you start figuring out information, people realize not everything causes cancer.
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Is Cancer Prevention Not Possible?

ConfidentGetHealthInfo vs PreventionNotPossible



Observation:

- High confidence to get needed health information -> believe Prevention is possible.
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Summary

- Social and economic factors influence health information seeking.
- Telephone information is more frustrating
 - Chatbots
- How can we improve health info seeking?
 - Filtering out Reliable resources
 - Health info index ranking of websites

We can influence the health related information seeking of the people by monitoring the current health behaviour and motivating people to seek for reliable health information.

Thank You
