It can be appropriate to represent an entire population by only a sample. The major caveat is that the same must have a proper distribution of the population to be accurate. If the sample is weighted a certain way, it will not give an accurate representation of the population.

A common example of a question that comes up in computer science is how popular a programming language is by how many developers are using a particular language. This is a common survey that is used to track changes in how popular a particular programming language is relative to the other languages.

In my example there are a lot of variables that are worth tracking, these surveys include hobby and professional programmers. For me the most important information is what professional programmers are using because I am looking to switch careers to development. Another important piece of information is where these programmers are located. Where I currently live as numerous positions so it would be beneficial to understand the local market. A flaw with the survey is it doesn’t account for developers who self-report using more than one language. It is not uncommon for developers to use multiple languages within a specific environment based on the tasks they’re trying to accomplish.

References

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