Relative effects

From: Key Concepts for assessing claims about treatment effects and making well-informed treatment choices (Version 2022)

2.3b Be cautious of relative effects of treatments alone.

Explanation

Relative effects are ratios, for example, the ratio of the probability of an outcome in one treatment group compared with that in a comparison group. They are insufficient for judging the importance of the difference (between the frequencies of the outcome). A relative effect may give the impression that a difference is more important than it actually is when the likelihood of the outcome is small to begin with. For example, if a treatment reduces the probability of getting an illness by 50% but also has harms, and the risk of getting the illness is 2 in 100, receiving the treatment may be worthwhile. If, however, the risk of getting the illness is 2 in 10,000, then receiving the treatment may not be worthwhile even though the *relative* effect is the same.

Absolute effects are differences, for example, the difference between the probability of an outcome in one treatment group compared with that in a comparison group. The absolute effect of a treatment is likely to vary for people with different baseline risks. Facemasks, for example, may have dramatically different effects depending on the baseline risk of infection *[Schünemann 2020]*. Facemasks reduce transmission of viruses, including coronavirus, but it is uncertain how effective they are for preventing Covid-19 infections *[Chu 2020 (SR), Glasziou 2021 , Talic 2021 (SR), Vestrheim 2020 (SR)]*. If we assume a 40% relative reduction in the number of new Covid-19 infections, it is possible to estimate the absolute effect for different baseline risks (see the table below). If the baseline risk is zero, it does not make a difference whether facemasks are used. The number of new infections is zero either way. If there is a low baseline risk, for example in the community when the incidence of Covid-19 is low (and not increasing), the difference is small (about eight fewer new infections if 10,000 people used facemasks for about two months). On the other hand, if the baseline risk is high, say for healthcare workers exposed to patients with Covid-19, the difference is much larger (about 700 fewer new infections per 10,000 people). In fact, the relative effect may also be larger for healthcare workers, if they use medical facemasks (rather than cloth masks), have training, and more often use facemasks correctly compared to people in the community. The absolute effect would also then be larger.

	Baseline risk[a]	**Risk with facemasks[b]**	**Difference[c]**
No new infections	0	0	0
Low risk	0.2%	0.12%	0.08% (8 fewer per 10,000)
High risk	17.4%	10%	7% (700 fewer per 10,000)

a) The low baseline risk corresponds to the number of new infections in eight weeks without facemasks if the two-week incidence is 50 per 100,000. The high risk is the assumed baseline risk from a systematic review *[Chu 2020 (SR)]*.

b) The risk with facemasks is based on reducing the baseline risk by 40% (the assumed relative risk reduction).

c) The difference between the baseline risk (without facemasks) and the risk with facemasks how many fewer new infections there would be with using facemasks compared to not using facemasks.

Basis for this concept

A relative effect may give readers the impression that a difference is more important than it actually is when the likelihood of the outcome is small to begin with. A systematic review found that showing people a relative risk reduction increased their willingness to get treatment, their willingness to advise treatment, and their willingness to pay to prevent the risk, compared to showing them the absolute effect *[Visschers 2009 (SR)]*. Another systematic review of randomized trials comparing people's responses to relative and absolute effects did not find a difference in understanding but found that relative effects were perceived to be larger and more persuasive *[Akl 2011b (SR)]*. A third systematic review found that presentations including risk differences were better than those including relative risk reductions for maximising accuracy and seemed less likely than presentations with relative risk reductions to influence decisions to accept a treatment *[Zipkin 2014 (SR)]*. Earlier systematic reviews had similar findings *[McGettigan 1999 (SR), Moxey 2003 (SR)]*.

Relative measures tend to be consistent across risk groups, whereas absolute measures do not *[Deeks 2002 (RS), Engels 2000 (RS), Furukawa 2002 (RS), Schmid 1998 (RS)]*. For this reason, meta-analyses tend to use a relative effect measure when estimating the average effect across studies. The risk difference can then be estimated by applying the relative effect to one or more relevant baseline risks *[Guyatt 2013a]*, as illustrated in the table above (if there is not a reason to expect different relative effects).

Implications

Always consider the absolute effects of treatments – that is, the difference in outcomes between the treatment groups being compared. Do not make a treatment decision based on relative effects alone.

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