Encouraging vaccine uptake: lessons from behavioural science

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Understanding the behaviour surrounding vaccine uptake involves issues of capability, opportunity and motivation. Despite the advice of social scientists with a long history of research in understanding behaviour, many policy makers have so far paid too little attention to the role of opportunity issues such as accessibility and cost, instead focusing on capability and motivation issues, such as knowledge and desire to get vaccinated, respectively.

Even in countries with plentiful supply of COVID-19 vaccines, uptake has been generally suboptimal, especially in particular population groups. The UK is a case in point, with one-third of the population aged ≥12 not having had all of the vaccinations for which they are eligible and 10% being completely unvaccinated[1]. These figures are higher in those living in deprived areas and for Black Caribbean, Black African and Pakistani ethnic groups. Efforts to increase vaccine uptake have been only partially effective. I believe that this has been, at least in part, because of a failure to understand the factors that influence this behaviour.

Vaccination uptake involves the behaviour of those being offered the vaccine, and those offering and communicating about the vaccine. There is a long-established science that can be drawn on to explain these behaviours[2]; we are not reliant on our intuition and 'common sense'. Indeed, in the UK, multiple reports by behavioural scientists addressing this problem as part of their advice to government have been published. Worryingly, the advice of behavioural scientists does not seem to have been followed in the UK or by governments in many other parts of the world.

Capability, opportunity and motivation

A good starting point to understand behaviour is the simple, yet comprehensive COM-B (Capability–Opportunity–Motivation–Behaviour) model. It recognizes that a behaviour will only occur if people have the capability and opportunity to enact that behaviour and are more motivated at the relevant moment to enact that behaviour than any other behaviours they could be doing[3,4]. Capability refers to both psychological capability (for example, knowledge and understanding) and physical capability (for example, strength and co-ordination). Opportunity refers to a physical and social environment that supports the behaviour (for example, ease of access and social norms). Motivation encompasses both reflective processes (our self-aware choices and decisions) and more automatic processes such as emotions and habits. The components of COM-B interact as a dynamic system that evolves over time (FIG. 1).

So, to what extent has low vaccine uptake been due to lack of knowledge and poor understanding of the vaccines, restricted opportunities for vaccination and/or motivational issues? The answer to this question varies across countries and across population groups within countries but there are some generic principles that apply widely. These can inform how one analyses, understands and intervenes to address the problem.

People may be motivated not to get vaccinated because of worries about the side effects, because they do not believe vaccines are effective, because vaccination conflicts with an important part of their identity or belief system or because of a distrust of government and medical authorities[5]. Others may not have strong motivations to refuse vaccination but rather lack sufficient motivation to make or attend the appointment above motivations for competing activities. Anti-vaccination sentiment, despite being very vocal on social media, varies widely across countries; many of those who have not been vaccinated may simply have not got around to it or are uncertain about whether it is worth the possible risk[6].

Changing behaviour

As illustrated in the COM-B model, motivation can be increased directly by listening to and addressing people's

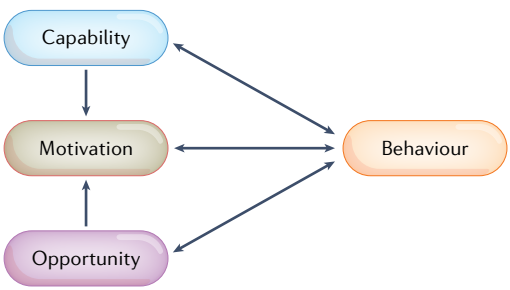

Fig. 1 | **The COM-B model.** COM-B, Capability–Opportunity–Motivation–Behaviour.

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concerns, as well as indirectly by increasing knowledge (a type of capability) and opportunity. The questions people usually ask and want answers to are: is the disease bad enough to warrant vaccination; is the vaccine effective; are there side-effects or long-term harms? Research has shown that explicit discussion of trade-offs in addressing these questions, rather than avoiding any acknowledgement of risk, did not harm overall support for vaccination or trust in health authorities[7]. Basic principles of communication apply that could be used to inform public health messaging — provide information that is easy to understand and engage with, tailored in language, style and media to target groups, given by trusted people and authorities. Use simple, clear and consistent messaging and be transparent about the data and science behind the policy of vaccination.

The COM-B model is linked to a framework of intervention types and policy options, the Behaviour Change Wheel[3,4]. Interventions and policies can be selected according to one's understanding of the extent to which capability and/or opportunity and/or motivation need to change. 'Education' is only one of nine types of intervention in this framework; another is 'persuasion'. To be persuasive, a person needs to show understanding, respect and interest in others by asking open-ended questions to find out their beliefs, specific concerns and uncertainties, and then address them non-judgmentally without, for example, contradicting. Building trust is a key predictor of vaccine acceptance, and an antidote to misinformation[8]. Trust is increased by clear and specific advice; vague reassurance rather than transparency does not increase vaccine acceptance and decreases trust in authorities[9]. We should look to coordinate public health drives to increase vaccination with trusted people within local communities such as local health professionals or faith leaders.

Persuasive arguments for vaccination focus on the protection of others, the health service, the economy and society, and not just on benefits for the individual. They address the person, for example, explaining that millions of people who are like them have been vaccinated with negligible problems and avoided severe illness, hospitalization and death. Anticipated regret is another effective persuasive argument shown to be associated with increased uptake; that not having been vaccinated may increase the risk of developing Long COVID or that if many people are unvaccinated future restrictions may be necessary. A third type of intervention is 'enablement', which involves establishing support of various kinds; for example, providing support for immediate action in terms of booking an appointment as soon as someone shows interest in vaccination.

Evidence shows that increasing vaccination uptake is not just about increasing knowledge (capability) and motivation, but also about increasing the opportunity for vaccination[10]. Key issues in this regard are access, cost and convenience. Getting vaccinated needs to be easy and cost-free, with local, accessible facilities and paid time off work to attend for vaccination and in case of symptoms after vaccination. Some people have insufficient digital literacy to book online appointments, others can not afford travel to get to centres. These are practical problems that can be addressed, but to do so will need a combination of government and employment policies, and encouragement and support from managers and professionals.

Conclusions

Much of current policy surrounding vaccination in the USA and Western Europe has focused on issues of capability and motivation, with approaches designed to counter misinformation, which often involves minimizing the risks despite evidence for the contrary approach, and to make vaccination compulsory or required for travel or entry into certain venues. However, it is important that we do not assume that we know why people have not been vaccinated. In many cases, this may reflect practical issues such as accessibility and cost just as much as knowledge or desire to get vaccinated, and these issues require different approaches such as financial help and improving local access and access for vulnerable populations. Furthermore, as the COM-B model shows, making accessing vaccination difficult can reduce motivation, and so measures to increase the opportunity for vaccination will also have a beneficial impact on motivation, creating a positive-feedback loop.

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Competing interests
The author declares no competing interests.