

## Review Article

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# Addressing vaccine hesitancy: the LEARN approach

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## ABSTRACT

Immunization programs today stand at crossroads. Even as COVID vaccine campaigns continue, inequity, concerns and confusion around them seems ever expanding. While vaccine hesitancy in some form or the other has existed since the inception of vaccination, the complex and dynamic world that we live in now has resulted in hesitancy to vaccines become an outcome of myriad interactions that we encounter in our day to day lives. Factors extraneous to health systems are major determinants and it is essentially the culmination of economics, politics, science, and technology impacting human behaviors and emotions which result in a parent, family or a community arrive at the decision of whether to or not to vaccinate. Vaccine hesitancy is on the rise, it is becoming more organized and now is not just a problem of high- income countries. It is imperative that as public health advocates, academicians, policy makers, managers and implementers we recognize it and adopt a non-judgmental and non-partisan approach built on empathy, respect and trust and not just scientific knowledge and theorems to address it. The current paper puts forward a novel approach to address hesitancy, the LEARN approach: and advocates that we need to 'Listen' to the voices of concern, 'Engage' with all stakeholders, 'Articulate' and communicate better in a language which is simple and comprehensible, 'Reflect' on what works and what does not and at the same time 'Negate' events and episodes which dent confidence in science and promote complacency.

**Keywords:** Immunization, Vaccines, Vaccination, Vaccine confidence, Vaccine hesitancy

## INTRODUCTION

Seldom has something captured the imagination of the 7.8 billion residents of the planet as COVID-19 has done.<sup>1</sup> It may not be overtly wrong to suggest that the virus is now ingrained and imprinted in our DNA, "coronavirus" was the most searched topic on Google in 2020.<sup>2</sup> The pandemic has resulted in transformative shifts in the way we lead life and has brought to the forefront a myriad of discussions which were never mainstreamed in conversations. With COVID-19 vaccination programs underway globally, the attention remains on vaccines with possibly for the first-time terms like vaccine development, clinical trials, pre-clinical trials, vaccine efficacy, vaccine safety, adverse events, live, attenuated, inactive, vector, mRNA and DNA vaccines, vaccine acceptance, vaccine eagerness, vaccine hesitancy and vaccine refusal becoming common parlance.

## GETTING VACCINATED: YES OR NO

Of the various gifts of science and innovation, immunization ranks very high. Immunization saves lives of not only who get vaccinated but also others, prevents morbidities, results in significant economic gains and there is a host of data to support this. Immunization programs have also been the platforms on which multiple primary health care systems across the globe have been developed. However, what also sets apart immunization is the very fact that it engages, involves, and brings to the forefront human behaviors and emotions. While we as public health advocates often view it with detachment and purely from a scientific perspective, the very act of seeing a newborn pricked with a needle is enough to spring up a conundrum of feelings in the mother, the father or the family. Vaccinations are thus both a community and

personal issue and a decision we take not only for ourselves but also for fellow humans.

It is possible for this very reason that vaccinations have been studied, watched, and interpreted with much interest. From its early days, when the experiments with cowpox began and even prior to that through variolation and insufflation vaccination has been hailed as an act alleviating death, discomfort and misery and albeit in minor proportions as something which is impractical and not needed at all. Documented literature reflects strong opposition to Edward Jenner's efforts with his original paper on smallpox vaccination being rejected by the royal society of England as being too fantastical and in opposition to what was previously known.<sup>3</sup> More so, Jenner's work was seen not only as blurring the line between human and beast but between social classes.<sup>4</sup> Thus, support for and against vaccination has always existed since the beginning. However, over the last few years there has been a concerted rise and interest in vaccine hesitancy with the world health organization identifying it as one of the top 10 threats to global health in 2019.<sup>5</sup>

My understanding on vaccine hesitancy has been shaped up by the "COVID-19 Peer Hub level 1 peer learning exercise: From vaccine hesitancy to acceptance" anchored by the Geneva learning foundation,<sup>6</sup> in which I recently participated and by two books that I have recently read on the subject: "Anti-vaxxers: How to challenge a misinformed movement" by asst. Prof. Jonathan M. Berman and "Stuck: How vaccine rumors start-and why they don't go away" by Prof. Heidi J. Larson. Both the books have been instrumental in ensuring that I am well acquainted with both the facets of vaccination: the history of pro and anti-vaccine efforts, the dynamics, the various stakeholders, the why and how of choices that we make and the implications of the same. The work by the SAGE working group on vaccine hesitancy and other studies which have tried to explore various determinants of hesitancy have further contributed to my understanding.<sup>7-11</sup>

## **VACCINE HESITANCY: THE MULTIPLE LAYERS TO IT**

The SAGE working group defined vaccine hesitancy as "delay in acceptance or refusal of vaccination despite availability of vaccination services.<sup>7</sup> Vaccine hesitancy is complex and context specific, varying across time, place and vaccines. It is influenced by factors such as complacency, convenience and confidence." The WHO SAGE working group, along with several other social scientists, further define vaccine hesitancy on the continuum of those who fully accept with few doubts, those who delay the vaccination schedule, and those who completely reject vaccines.<sup>9,12,13</sup> Alternately the more positive term 'vaccine confidence' is also used by the vaccine confidence project and US national vaccine advisory committee.<sup>14</sup> Moreover, the factors influencing

vaccine hesitancy have been explained on the basis of the epidemiological triad i.e. the complex interaction of environmental (external) factors, agent factors (vaccine) and the host (parents) specific factors.<sup>15</sup>

The SAGE definition is most widely used and while the definition is broad and address the major issues related to hesitancy, possibly going forward the definition needs a couple of additional Cs factored in: compassion and consideration. There are growing concerns that as science and public health representatives we have been too caught up with the actual and factual act of vaccination and have not really dwelled deeper into the socio-cultural and behavioral aspects which drive vaccination programs globally.

In today's world the sphere of influence has a far greater bearing on the decisions that we make and the interconnectedness of various facets of life have a definite impact on it. Today we live in an ever evolving world where thoughts and ideas are made and shredded at short intervals thereby ensuring that adaptability is what keeps us driving, among other things this also has ramifications on getting children and individuals immunized, vaccination as we know it is now not merely an interaction between a health worker and a beneficiary but a culmination of multiple factors finally resulting in a mother/father/guardian bringing the child to the immunization session site for vaccination. It is the culmination of economics, politics, science, and technology impacting human behaviors and emotions to arrive at the decision of whether to or not to vaccinate.

The pandemic and the discussions around it very well illustrates that vaccination in the current context has become overtly political and in the coming years it will be a major determinant in electioneering.<sup>16-18</sup> While on one hand the very successful mission Indradhanush campaigns in India have been used in a positive connotation demonstrating political will and multisectoral coordination, episodes related to the introduction of the dengue vaccine in Philippines amplify the risks of using vaccines as a political tool with assessments in the same country reflecting a dramatic drop in vaccine confidence from 93% "strongly agreeing" that vaccines are important in 2015 to 32% in 2018.<sup>19,20</sup> It is also a reminder for being pragmatic during new vaccine introduction.<sup>21</sup> Documented evidence points towards purposeful polarization of evidence, exploiting doubting public and system weaknesses for political purposes while in other cases waning vaccine confidence being reflective of general mistrust of government and scientific elites.<sup>22-24</sup>

Another major determinant is science and technology, it has influenced each and every aspect of our life. While rapid advancements in technology have resulted in transformative shift for the immunization program with electronic vaccine intelligence network (eVIN) and COWIN (COVID-19 vaccine intelligence networks) being identified as gamechangers for the immunization

program in India.<sup>25,26</sup> Similarly, the rapid development of the mRNA COVID-19 vaccines is another major milestone.<sup>27</sup> On the other hand, with 2.7 billion monthly active Facebook users in the second quarter of 2020 and 200 billion tweets per year the advent of social media has contributed to a rapid spread of vaccine related disinformation and misinformation, the speed and spread of which is often difficult to fathom.<sup>28,29</sup> Available literature does point towards extensive anti-vaccine content being shared on social media with some using vaccines as a platform for wider ramifications.<sup>23,30,31</sup> Moreover, vaccine critical web pages can quickly increase the perception of vaccine risk and decrease the likelihood of parents to vaccinate.<sup>32,33</sup> While recently efforts have been undertaken by social media companies to monitor and check vaccine misinformation, this remains a major cause for concern.<sup>34,35</sup>

The economic impact of immunization is unsurmountable. A recent study estimated the net benefits of immunization against 10 pathogens for 94 LMICS to be \$1,445.3 billion and \$3,371.5 billion, using the cost-of-illness and value-of-a-statistical-life methods, respectively between 2011-2030.<sup>36</sup> However, sceptics have also pointed towards the profit motive of manufacturers producing them with the purported link between “Big Pharma” and immunization programs often related to rising vaccine hesitancy.<sup>3,37</sup>

A factor which is widely cited as a major determinant of hesitancy is religion. However, more often it is an individual or collective interpretation of religion which is more to do human psychology rather than any specific religion advocating or negating vaccination.

It is thus clear that vaccinations now operate in a complex environment beyond the traditional parameters of health systems with the extraneous factors finally resulting in desired behaviors at an individual or family level.

Vaccine hesitancy is definitely on the rise and while earlier this was more of a concern in high income countries, recent data does point towards rising vaccine hesitancy in middle income countries and LMICs. While India, Mexico, Poland, Romania, and Thailand reported increased vaccine confidence (for safety, importance, and effectiveness) between 2015-2019, Indonesia, the Philippines, Pakistan, and South Korea reported decreasing confidence for all the three parameters in the same period.<sup>11</sup> Even in India studies from different parts of the country do report variable rates of hesitancy.<sup>38-40</sup> The disruption to the measles rubella (MR) campaigns conducted in 2018-19 and recent surveys denoting skepticism to COVID-19 vaccination uptake in India further add to the concern with a possible adverse impact on the national universal immunization program (UIP).<sup>41-46</sup> Thus, it is essential that a proactive approach to addressing vaccine hesitancy is developed and the COVID-19 vaccine roll out presents the opportune

moment to shape and define the approach: which is built on empathy, respect and trust and not just scientific knowledge and theorems.<sup>47,48</sup>

## DISCUSSION

### *The LEARN approach to addressing vaccine hesitancy*

Addressing vaccine hesitancy requires a socio-cultural approach rather than a purely health-based approach, more so it needs to be simple and comprehensible. Listen, engage, articulate, reflect and negate are the driving words which should govern our approach to vaccine hesitancy

#### *Listen*

It is important that stakeholders engaged with the vaccination program are fully aware of the discussions around hesitancy, it is only when we are aware of our surroundings that we are in a position to address issues and challenges proactively and efficiently. We definitely need to enhance our ability to listen and understand the pulse of the community and beneficiaries using a variety of tools. While on one hand “social media tracking” and “social listening” needs to be institutionalized in our health programs, we should continue using traditional methods to gain insights for example through frontline health workers (FLWs), health care providers (HCPs), self-help groups (SHGs) and professional health associations.<sup>49,50</sup>

#### *Engage*

We need to be open and involve all voices in the discussion. Prof. Larson puts it very succinctly “Immunization programs that reach publics and individuals globally are a platform for outreach and engagement that official health authorities have not used as effectively as the dissenting and disrupting voices. This is an especially valuable opportunity with the new generation of scientists and medical professionals that are more digitally fluent and comfortable with new media to be able to use that global stage to challenge and engage with the public through social media, but it is also a time to engage vaccine champions beyond health circles.”<sup>51</sup> There have been concerns that discussing vaccine hesitancy will give the antivaccine lobby greater legitimacy.<sup>39</sup> However, this concern is unfounded and rather than pushing away voices of concern it is imperative that they should be heard emphatically, concerns addressed as often parents complain about not getting heard or being labelled as anti-science and anti-vaccine.<sup>3,52</sup> All stakeholders be it influencers, religious leaders, public representatives, healthcare providers, administrators, parents and the community need to be engaged and kept informed.

### Articulate

Communication is the key and the language of communication the master key. As program managers and health advocates, we need to simplify our sentences and writings. We need to speak the language of the people which is easily understood and comprehended. Community engagement and ownership is the fulcrum for all health programs and to ensure continued support we have to focus on how and what we communicate and articulate. Healthcare providers and family physicians are the most trusted sources of information for beneficiaries and we need to build on this ensuring that the trust on vaccines remains unequivocal.<sup>53-55</sup> Furthermore, all communication efforts should be designed by understanding the target audience, building strategies according to the needs of the target audience and designing interventions reflective of the socio-cultural landscape.<sup>56</sup> In addition, capacity of health care providers on interpersonal communication skills and social and behavior change communication should be improved, while the boosting routine immunization demand generation (bridge) immunization training developed by the ministry of health and family welfare, government of India is a good example of work on this front, more effort is needed in this direction.<sup>57</sup> Taking cue from efforts towards institutionalizing respectful maternity care, similarly respectful immunization care (RIC) can be propagated to improve the quality of immunization services.

### Reflect

All efforts targeted at addressing vaccine hesitancy should have a feedback loop inbuilt and approaches and interventions should continually be accordingly tailored. We need to be ready to acknowledge issues and challenges and proactively address them. The immunization program has become complex with multiple new vaccines being added to immunization schedules across countries and hence the science is ever evolving with new information being continually added. This makes it mandatory for operational research on vaccine hesitancy being undertaken using available tools and developing new metrics.<sup>58-60</sup> National immunization programs should include guidelines and measures to address hesitancy and improvise on them as per need. We should leverage social science and behavioral science approaches to further our understanding and interpretations.

### Negate

Finally, it is also essential to keep a strict vigil and proactively respond to threats to the program. While we need to be more open and inclusive, events and episodes which dent confidence in science and promote complacency should be countered. Our programs need to differentiate between genuine concerns of beneficiaries and communities and malicious intentions.

## CONCLUSION

Public health programs or for that matter any initiative targeted towards improving lives have two stakeholders those who design and implement the program and for those whom the program is designed for and implemented. Until and unless both these stakeholders are aligned and in unison all efforts will fail to start off or remain sub-optimal. Fareed Zakaria in his recently released book “Ten lessons for a post-pandemic world” lists out an important lesson for all of us: “People should listen to the experts and experts should listen to the people”.<sup>61</sup> This sentence very well captures the essence of the approach towards addressing and mitigating vaccine hesitancy: policy makers, scientists, vaccinologists and program managers acknowledging the concerns and addressing it proactively with empathy thereby fostering accountability and garnering trust of the people who in turn move ahead on the path of science by feeling safe, secure and supported.

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## REFERENCES

1. Worldometers. Available at: <https://www.worldometers.info/world-population/>. Accessed on 28 December 2020.
2. Coronavirus and sourdough - this is what we searched for online in 2020, 2020. Available at: <https://www.weforum.org/agenda/2020/12/google-most-popular-search-2020/>. Accessed on 29 December 2020.
3. Berman MJ. Anti-vaxxers: How to Challenge a Misinformed Movement. Massachusetts: The MIT Press. 2020.
4. Moseley B. A Treatise on the “lues Bovilla” or Cow Pox, by Benjamin Moseley, 2<sup>nd</sup> ed. 1805.
5. Available at: <https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019>. Accessed on 29 December 2020
6. Available at: <https://www.learning.foundation/covid>. Accessed on 29 December 2020.
7. Macdonald NE. Vaccine hesitancy: Definition, scope and determinants. Vaccine. 2015;33:4161-4.
8. Available at: <https://www.clinicaltherapeutics.com/action/showPdf?pii=S0149-2918%2817%2930770-1>. Accessed on 29 December 2020.
9. Jarrett C, Wilson R, O’Leary M, Eckersberger E, Larson HJ. Strategies for addressing vaccine

hesitancy-a systematic review. *Vaccine*. 2015;33(34):4180-90.

- 10. Puri N, Coomes EA, Haghbayan H, Gunaratne K. social media and vaccine hesitancy: new updates for the era of COVID-19 and globalized infectious diseases. *Human Vaccines Immunotherap*. 2020;16(11):2586-93.
- 11. De Figueiredo A, Simas C, Karafillakis E, Paterson P, Larson HJ. Mapping global trends in vaccine confidence and investigating barriers to vaccine uptake: a large-scale retrospective temporal modelling study. *Lancet*. 2020;396(10255):898-908.
- 12. World Health Organization. Report of the SAGE Working Group on Vaccine Hesitancy. 2014. Available at: <https://www.who.int/immunization/sage/meetings/2014/october/SAGEworkinggrouprevisedreportvaccinehesitancy.pdf?ua=1>. Accessed on 05 January 2021.
- 13. Leask J, Kinnersley P, Jackson C, Cheater F, Bedford H, Rowles G. Communicating with parents about vaccination: A framework for health professionals. *BMC Pediatr*. 2012;12:154.
- 14. Tull K. Vaccine hesitancy: guidance and interventions. K4D Helpdesk Report 672. Brighton, UK: Institute of Development Studies. 2019.
- 15. Kumar D, Chandra R, Mathur M, Samdariya S, Kapoor N. Vaccine hesitancy: understanding better to address better. *Isr J Health Policy Res*. 2016;5:2.
- 16. Why 3 former US presidents are offering to take the Covid-19 vaccine publicly, 2020. Available at: <https://indianexpress.com/article/explained/explained-why-three-former-us-presidents-are-offering-to-take-covid-19-vaccine-publicly-7093962/>. Accessed on 30 December 2020.
- 17. PM Modi reviews COVID-19 vaccine development, visits labs in Pune, Hyderabad and Ahmedabad, 2020. Available at: <https://www.timesnownews.com/india/article/pm-modi-to-review-covid-19-vaccine-development-in-zydus-biotech-park-in-ahmedabad-bharat-biotech-in-hyderabad-serum-institute-of-india-in-pune/687780> Accessed on 30 December 2020.
- 18. Vaccine can turn people into crocodiles, 2020. Available at: <https://www.thehindu.com/news/international/vaccine-can-turn-people-into-crocodiles/article33374608.ece>. Accessed on 30 December 2020.
- 19. Gurnani V, Haldar P, Aggarwal MK, Das MK, Chauhan A, Murray J et al. Improving vaccination coverage in India: lessons from Intensified Mission Indradhanush, a cross-sectoral systems strengthening strategy. *BMJ*. 2020;363:k4782.
- 20. Larson HJ, Hartigan-Go K, De Figueiredo A. Vaccine confidence plummets in the Philippines following dengue vaccine scare: why it matters to pandemic preparedness. *Hum Vaccines Immunother*. 2018;15:3:625-7.
- 21. Rush To Produce, Sell Vaccine Put Kids In Philippines At Risk, 2019. Available at: <https://www.npr.org/sections/goatsandsoda/2019/05/03/719037789/botched-vaccine-launch-has-deadly-repercussions>. Accessed on 30 December 2020.
- 22. Frew PM, Kriss JL, Chamberlain AT. A randomized trial of maternal influenza immunization decision-making: a test of persuasive messaging models. *Hum Vaccines Immunother*. 2016;12:1989-96.
- 23. Broniatowski DA, Jamison AM, Qi S. Weaponized health communication: Twitter bots and Russian trolls amplify the vaccine debate. *Am J Public Health*. 2018;108:1378-84.
- 24. Larson HJ, de Figueiredo A, Xiaohong Z. The state of vaccine confidence 2016: global insights through a 67-country survey. *E Bio Med*. 2016;12:295-301.
- 25. Gurnani V, Singh P, Haldar P, Aggarwal MK, Agrahari K, Kashyap S et al. Programmatic assessment of electronic Vaccine Intelligence Network (eVIN). *PLoS ONE*. 2020;15(11):e0241369.
- 26. Government of India: COVID-19 Vaccines Operational Guidelines. Ministry of Health and Family Welfare; 2020
- 27. Abbasi J. COVID-19 and mRNA Vaccines-First Large Test for a New Approach. *JAMA*. 2020;324(12):1125-7.
- 28. Available at: <https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/>. Accessed on 31 December 2020.
- 29. Available at: <https://www.dsayce.com/social-media/tweets-day/>. Accessed on 31/12/2020.
- 30. Meleo-Erwin Z, Basch C, MacLean SA, Scheibner C, Cadoret V. "To each his own": discussions of vaccine decision-making in top parenting blogs. *Hum Vaccin Immunother*. 2017;13(8):1895-901.
- 31. Oehler RL. On measles, vaccination, social media activism and how to win back our role as our patients' best advocates. *Clin Infectious Diseases*. 2019;cid/ciz656.
- 32. Betsch C, Renkewitz F, Betsch T, Ulshöfer C. The influence of vaccine-critical websites on perceiving vaccination risks. *J Health Psychol*. 2010;15(3):446-55.
- 33. Betsch C, Renkewitz F. Long term Effects of an Information Search on Vaccine-Critical Internet Sites. *Prevention*. 2009;32:125-8.
- 34. Donovan J. Social-media companies must flatten the curve of misinformation. *Nature*. 2020.
- 35. WHO director-general statement on the role of social media platforms in health information. 2019. Available at: <https://www.who.int/news-room/detail/28-08-2019-who-director-general-statement-on-the-role-of-social-media-platforms-in-healthinformation>. Accessed on 31 December 2020.
- 36. Sim SY, Watts E, Constenla D, Brenzel L, Patenaude B. Return On Investment from Immunization Against 10 Pathogens In 94 Low- And Middle-Income Countries, 2011-30 Health Affairs. 2020;39(8):1343-53.
- 37. Many Anti-Vaxxers Don't Trust Big Pharma. There's a Reason for That, 2019. Available at: <https://thewire.in/the-sciences/many-anti-vaxxers->

dont-trust-big-pharma-theres-a-reason-for-that. Accessed on 31 December 2020.

38. Sankaranarayanan S, Jayaraman A, Gopichandran V. Assessment of vaccine hesitancy among parents of children between 1 and 5 years of age at a tertiary care hospital in Chennai. *Indian J Community Med*. 2019;44(4):394.

39. Agrawal A, Kolhapure S, Di Pasquale A, Rai J, Mathur A. Vaccine Hesitancy as a Challenge or Vaccine Confidence as an Opportunity for Childhood Immunisation in India. *Infect Dis Ther*. 2020;9(3):421-32.

40. Gopalakrishnan S. Vaccine hesitancy in India-the challenges: a review *Int J Community Med Public Health*. 2020;7(11):4643-7.

41. WhatsApp rumours about vaccinations hamper India's drive to halt measles and rubella, 2017. Available at: <https://scroll.in/pulse/830129/rumours-about-measles-rubella-vaccine-hit-coverage>. Accessed on 02 January 2021.

42. Sreedevi A. Measles-Rubella vaccination campaign: A trust deficit? *J Postgrad Med*. 2018;64(4):202-3.

43. Krishnendhu VK, George LS. Drivers and barriers for measles rubella vaccination campaign: A qualitative study. *J Family Med Prim Care*. 2019;8:881-5.

44. Most people still wary of 'quick COVID-19 vaccination': LocalCircles survey, 2020. Available at: <https://www.businessstoday.in/coronavirus/most-people-still-wary-quick-covid-19-vaccination-local-circles/story/423610.html>. Accessed on 02 January 2021.

45. Why Would You Not Want to Take a COVID Vaccine, 2020. Available at: <https://timesofindia.indiatimes.com/india/why-would-you-not-want-to-take-a-covid-vaccine/articleshow/78140327.cms>. Accessed on 02 January 2021.

46. Vaccine hesitancy: Why it could affect India's vaccination drive. Available at: <https://timesofindia.indiatimes.com/india/vaccine-hesitancy-why-it-could-affect-indias-vaccination-drive/articleshow/79799735.cms>. Accessed on 02 January 2021.

47. Gesualdo F, Zamperini N, Tozzi AE. To talk better about vaccines, we should talk less about vaccines. *Vaccine*. 2018;36(34):5107-8.

48. Goldstein S, MacDonald NE, Guirguis S. Health communication and vaccine hesitancy. *Vaccine*. 2015;33(34):4212-4.

49. What Is Social Listening & Why Is It Important?, 2020. Available at: <https://blog.hubspot.com/service/social-listening>. Accessed on 03 January 2021.

50. 15 Best Social Listening Tools to Monitor Mentions of Your Brand, 2021. Available at: <https://blog.hubspot.com/service/social-listening-tools>. Accessed on 03 January 2021.

51. Das P, Heidi Larson: shifting the conversation about vaccine confidence. *The Lancet*. 2020;396(10255):877.

52. Larson HJ. Stuck-How vaccine rumours start-and why they don't go away. New York: Oxford University Press. 2020.

53. Salmon DA, Moulton LH, Omer SB, DeHart MP, Stokley S, Halsey NA. Factors associated with refusal of childhood vaccines among parents of school-aged children: A case-control study. *Arch Pediatr Adolesc Med*. 2005;159(5):470-6.

54. Paterson P, Meurice F, Stanberry LR, Glismann S, Rosenthal SL, Larson HJ. Vaccine hesitancy and healthcare providers. *Vaccine*. 2016;34(52):6700-6.

55. Mohanty S, Leader AE, Gibeau E, Johnson C. Using Facebook to reach adolescents for human papillomavirus (HPV) vaccination. *Vaccine*. 2018;36(40):5955-61.

56. Thomson A, Vallée-Tourangeau G, Suggs LS. Strategies to increase vaccine acceptance and uptake: from behavioral insights to context-specific, culturally appropriate, evidence-based communications and interventions. *Vaccine*. 2018;36(44):6457.

57. Operational Guidelines: IPC Skills Training in Routine Immunization for Frontline Workers (ANM, ASHA, AWW). Ministry of health and family welfare. New Delhi: Government of India, 2018.

58. Oduwole OE, Pienaar ED, Mahomed H, Iwu CJ. Current tools available for investigating vaccine hesitancy: A scoping review protocol. *BMJ Open*. 2019;9:e033245.

59. Gilkey MB, Magnus BE, Reiter PL, McRee AL, Dempsey AF, Brewer NT. The Vaccination Confidence Scale: A brief measure of parents' vaccination beliefs. *Vaccine*. 2014;32:6259-65.

60. Shapiro GK, Tatar O, Dubé E, Amsel R, Knäuper B, Naz A et al. The vaccine hesitancy scale: Psychometric properties and validation. *Vaccine*. 2018;36:660-7.

61. Zakaria F. Ten Lessons for a Post Pandemic World. Great Britain: Allen Lane. 2020.

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