Lest We Forget: COVID-19 Vaccine Hesitancy Among Women in Delhi

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1. Introduction

Note to the reader: Please note that the population addressed through the survey and the literature reviewed for this study is limited to the population that identifies itself as female irrespective of the sex that was assigned to them at birth.

1.1. *Vaccine Hesitancy as a concept*

Vaccines have historically played a pivotal role in decreasing morbidity and mortality rates of many infectious diseases worldwide.[1] Despite this, hesitant behaviours and suspicion towards new vaccines has been prevalent at the global level.[2]

According to the Strategic Advisory Group of Experts on Immunization (SAGE), vaccine hesitancy refers to the delay in accepting or refusing vaccination despite the availability of vaccination services.[3] Vaccine hesitancy is considered to be a complex phenomenon varying across time, place and type of vaccines. Hence, socio-economic conditions,[4] geographical locations[5] and other factors may have a bearing on vaccine hesitancy.

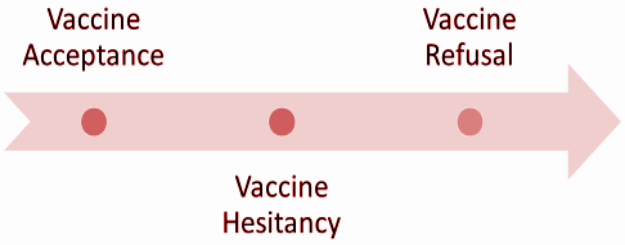

Figure 1

Multiple scholars have indicated that vaccine hesitancy, as a concept, is set on a continuum between those who accept all vaccines with no hesitation and those who refuse to accept any vaccine.[6] While vaccine hesitancy does not always amount to refusal, it significantly undermines individual and community protection efforts from vaccine-preventable diseases.[7]

1.2. *Factors contributing to vaccine hesitancy*

Vaccine hesitancy is typically dependent on a multitude of factors which may be at the individual or group level. For instance, individual preferences

[1] Ashish Agrawal et al., 'Vaccine Hesitancy as a Challenge or Vaccine Confidence as an Opportunity for Childhood Immunisation in India', *Infectious Disease and Therapy*, (May 2020) available at: https://link.springer.com/article/10.1007/s40121-020-00302-9 accessed on 20 July, 2022.
[2] Ohid Yaqub et al., 'Attitudes to Vaccination: A Critical Review', Social Science and Medicine (April 2014) available at: https://reader.elsevier.com/reader/sd/pii/S0277953614002421?token=965D5C8AFB31BF6AC2BCC4F64C79D6B76D1C6243EBD839A639C9BFEF89C996122732CFE440E30F7F75A9C3F4EBEF2298&originRegion=eu-west-1&originCreation=20221014081624 accessed on 14 October, 2022.
[3] N.E. MacDonald, 'Vaccine hesitancy: Definition, scope and determinants', *Vaccine*, (August 2015) available at: https://www.sciencedirect.com/science/article/pii/S0264410X15005009?via%3Dihub accessed on 20 July, 2022.
[4] Danielle Xiaodan Morales, Tyler Fox Beltran and Stephanie Alexandra Morales, 'Gender, socioeconomic status, and COVID-19 vaccine hesitancy in the US: An intersectionality approach', *Sociology of Health & Illness*, (May 2021) available at: https://doi.org/10.1111/1467-9566.13474 accessed on 13 October, 2022.
[5] Trinidad Beleche et. al., 'COVID-19 Vaccine Hesitancy: Demographic Factors, Geographic Patterns, and Changes over time', *ASPE: Office of Health Policy*, (May 2021) available at: https://aspe.hhs.gov/sites/default/files/private/pdf/265341/aspe-ib-vaccine-hesitancy.pdf accessed on 13 October, 2022.
[6] N.E. MacDonald, 'Vaccine hesitancy: Definition, scope and determinants', *Vaccine*, (August 2015) available at: https://www.sciencedirect.com/science/article/pii/S0264410X15005009 accessed on 20 July, 2022.
[7] Anoop T. Nair et al., 'Social media, vaccine hesitancy and trust deficit in immunization programs: a qualitative enquiry in Malappuram District of Kerala, India', *Health Research Policy and Systems*, (August 2021), available at: https://health-policy-systems.biomedcentral.com/articles/10.1186/s12961-021-00698-x accessed on 21 July 2022.

may stem from past experiences with vaccines, personal knowledge and awareness about the efficacy of the vaccine, associated risks and benefits, trust in the health care system as well as incidental costs.[8]

Likewise, at the societal level, determinants such as religion,[9] gender,[10] socio-economic background,[11] political beliefs,[12] media,[13] influential leaders,[14] among others could cause variations in the willingness of an individual to take the vaccine.

Based on the above, the SAGE Working Group on Vaccine Hesitancy noted that vaccine hesitancy is influenced by three broad factors: complacency, convenience and confidence which have been consolidated as the 3C's model.[15]

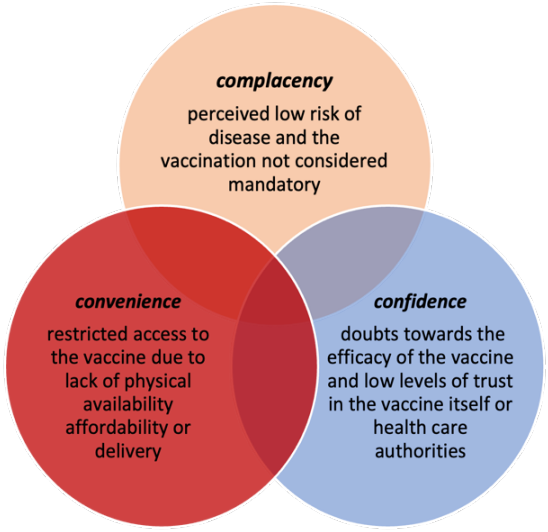

Figure 2

The three categories are as follows:

1. *complacency*, i.e., where the risk of the disease is perceived as low and the vaccination is not considered as mandatory;
2. *convenience*, i.e., where access to the vaccine is restricted due to lack of physical availability affordability or delivery; and
3. *confidence*, i.e., doubts towards the efficacy of the vaccine and low levels of trust in the vaccine itself or health care authorities. [16]

1.3. *Relevance and existence of vaccine hesitancy*

Public concerns about the effectiveness or need for vaccines are as old as vaccines themselves. Back in 1796, Edward Jenner, a British national, was hailed as a hero for developing the first vaccine to prevent smallpox – a disease that had plagued the world for centuries. The vaccination strategy involved injecting persons with cowpox, a milder version of smallpox, for immunisation. Despite this incredible feat, the

[8] Aldren Gonzales et. al., 'Overview of Barriers and Facilitators in COVID-19 vaccine outreach', *ASPE: Office of Health Policy*, (August 2021) available at: https://www.aspe.hhs.gov/sites/default/files/2021-08/Vaccine%20Outreach%20Research%20Report%208-27-2021%20FINAL.pdf accessed on 20 July, 2022.
[9] Louiegi L Garcia and John Federick C Yap, 'The role of religiosity in COVID-19 vaccine hesitancy', *Public Health* (September 2021) available at: https://academic.oup.com/jpubhealth/article/43/3/e529/6291509 accessed on 20 July, 2022.
[10] Stephanie Zintel, Charlotte Fock, *et al.*, 'Gender differences in the intention to get vaccinated against COVID-19: a systematic review and meta-analysis', *Journal of Public Health*, (January 2022) available at: https://link.springer.com/article/10.1007/s10389-021-01677-w accessed on 20 July, 2022.
[11] Danielle Xiaodan Morales, Tyler Fox Beltran and Stephanie Alexandra Morales, 'Gender, socioeconomic status, and COVID-19 vaccine hesitancy in the US: An intersectionality approach', *Sociology of Health & Illness*, (May 2021) available at: https://doi.org/10.1111/1467-9566.13474 accessed on 20 July, 2022.
[12] Don Albrecht, 'Vaccination, politics and COVID-19 impacts', *BMC Public Health*, (January 2022), available at: https://doi.org/10.1186/s12889-021-12432-x accessed on 20 July, 2022.
[13] Fidelia Cascini, et al., 'Social media and attitudes towards a COVID-19 vaccination: A systematic review of the literature' , *Clinical Medicine*, (June 2022) available at: https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(22)00184-5/fulltext accessed on 20 July, 2022; *See also* Anoop T. Nair, et al. 'Social media, vaccine hesitancy and trust deficit in immunisation programs: a qualitative enquiry in Malappuram District of Kerala, India', *Health Research Policy and Systems*, 19.2 (2021), available at: https://drive.google.com/file/d/1cxamOpiVSdHzjmyBSpLHleV5u_p2Lt8a/view?pli=1 accessed on 20 July, 2022.
[14] N.E. MacDonald, Robb Butler, Eve Dube, 'Addressing barriers to vaccine acceptance: an overview', *Human Vaccines & Immunotherapeutics* (January 2018), available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5791591/ accessed on 20 July, 2022.
[15] SAGE Working Group on Vaccine Hesitancy (November 2014) available at: https://www.asset-scienceinsociety.eu/sites/default/files/sage_working_group_revised_report_vaccine_hesitancy.pdf accessed on 13 October, 2022.
[16] Aldren Gonzales et. al., 'Overview of Barriers and Facilitators in COVID-19 vaccine outreach', *ASPE: Office of Health Policy*, (August 2021) available at: https://www.aspe.hhs.gov/sites/default/files/2021-08/Vaccine%20Outreach%20Research%20Report%208-27-2021%20FINAL.pdf accessed on 20 July, 2022.

vaccine was met with scepticism in various parts of the world.[17] Clerics warned their followers that taking the vaccination would contaminate the purity of their bodies and would further have dangerous side effects.[18]

Many years later, the universal vaccination programme against Hepatitis- B in France was suspended during the 1990s due to a false association between taking the vaccine and developing multiple sclerosis despite lack of clear scientific evidence.[19] Similarly, in a paper published in 1998, a British anti-vaccine activist published a case series suggesting that the measles, mumps and rubella (MMR) vaccine could trigger autism in children through behavioural regression.[20] This alleged link caused vaccination rates to drop as parents became more and more hesitant to get their children vaccinated against MMR. However, various studies undertaken and published thereafter clarified that there was no scientific evidence to establish a causal link between the MMR vaccination and autism. It was also proven that the initial findings alleging a causal link had been fraudulently arrived at through unethical means and had no real scientific basis.[21]

India too has had a long history of vaccine hesitancy. In colonial India, the population viewed smallpox vaccines with a sense of suspicion and many felt that the vaccine was a mechanism adopted by their colonisers to further intrude in their personal lives. [22] The poliomyelitis vaccine programme in the 2000s was vilified based on the false claim that the vaccination contained pig's blood as a part of its composition. However, active mobilisation and campaigning by health care officials and community influencers encouraging the uptake of the vaccination ultimately led to the eradication of the polio virus in India.[23]

Prior to the COVID-19 pandemic, India faced its most recent vaccine hesitancy crisis in 2017 against the Measles-Rubella (MR) campaign launched by the Ministry of Health and Family Welfare to vaccinate children in the age group of 9 months to 15 years. The immunisation campaign was disrupted due to the widespread dissemination of information through social media which highlighted minor adverse after-effects of the vaccine.[24] This resulted in vaccine hesitancy among parents who were reluctant in getting their children vaccinated. A study on MR vaccine hesitancy conducted in Puducherry revealed that the educational qualification of mothers and fathers was found to be a determinant of vaccine hesitancy since parents with primary to secondary education were found to be more vaccine hesitant as compared to parents who were graduates.[25] A separate study found that social media rumours, lack of knowledge about the vaccine and inadequate time in planning were the major reasons for vaccine hesitancy in the

[17] Niels Brimnes, 'Variolation, vaccination and popular resistance in early colonial south India', *National Library of Medicine*, (April 2004) available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC546339/ accessed on 20 July 2022.
[18] David Motadel, 'Vaccine Hesitancy is as old as Vaccines. I take comfort in that', *The New York Times*, (April 2021) available at: https://www.nytimes.com/2021/04/28/opinion/vaccine-hesitancy-smallpox.html accessed on 20 July, 2022.
[19] Dewesh Kumar, Rahul Chandra, Medha Mathur, *et al.* 'Vaccine hesitancy: understanding better to address better', *Israel Journal of Health Policy Research*, (February 2016) available at: https://doi.org/10.1186/s13584-016-0062-y accessed on 20 July, 2022.
[20] T.S. Sathyanarayana Rao, Chittranjan Andrade, 'The MMR vaccine and autism: Sensation, refutation, retraction, and fraud', *Indian Journal of Psychiatry*, (April-June 211), available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3136032/ accessed on 20 July, 2022.
[21] Fiona Godlee, Jane Smith, Harvey Marcovitch, 'Wakefield's article linking MMR vaccine and autism was fraudulent', *the BMJ Journals*, (January 2011), available at: https://doi.org/10.1136/bmj.c7452 accessed on 20 July, 2022.
[22] Niels Brimnes, 'Variolation, vaccination and popular resistance in early colonial south India', *National Library of Medicine*, (April 2004) available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC546339/ accessed on 20 July, 2022.
[23] Ashish Agrawal, *et al.*, 'Vaccine Hesitancy as a challenge or vaccine confidence as an opportunity for childhood immunisation in India', *Infect Dis Ther*, (April 2020), available at: https://d-nb.info/1216002088/34 accessed on 20 July, 2022.
[24] Yuvaraj Krishnamoorthy, *et al.*, 'Factors related to vaccine hesitancy during the implementation of Measles-Rubella campaign 2017 in rural Puducherry-A mixed-method study', *Journal of Family Medicine and Primary Care*, (December 2019), available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6924217/ accessed on 20 July, 2022.
[25] Yuvaraj Krishnamoorthy, *et al.*, 'Factors related to vaccine hesitancy during the implementation of Measles-Rubella campaign 2017 in rural Puducherry-A mixed-method study', *Journal of Family Medicine and Primary Care*, (December 2019), available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6924217/ accessed on 20 July, 2022.

case of MR vaccine. However, the vaccine was ultimately accepted after initial hesitancy due to motivation by primary care providers and trust in doctors.[26]

1.4. *Objective of the study*

The WHO-UNICEF Joint Reporting Form, after conducting an extensive survey on vaccine hesitancy in 2013, reported that the top three reasons for vaccine hesitancy were (1) beliefs, attitudes and motivation towards health; (2) perception of risk and benefits associated with the vaccine; and (3) external sources of information including news and media.[27]

Vast literature on the subject has now established that vaccine hesitancy, as a behaviour, is the product of an interplay of multiple factors. Since vaccine hesitancy significantly undermines public immunisation programmes, which have become more important than ever in light of the prevailing COVID-19 pandemic, the concept requires closer examination.

This descriptive study seeks to identify the factors that contribute to vaccine hesitancy from a gendered lens i.e., from the perspective of an Indian adult woman and in the context of COVID-19 vaccines. The report endeavours to make a closer enquiry into concerns, attitudes and other perspectives which shape acceptance, refusal or hesitancy to take vaccines among women in India.

In many societies, women have been socialised to provide care and maintenance to the family unit, thereby making them health managers and promoters of overall family health.[28] Hence lower vaccination rates among women not only expose them to dangerous diseases, but also place the immunisation of their whole family, including their children, at a higher risk.[29] Therefore, forming a better understanding of vaccination intentions among women may enable governments and other health authorities in better tailoring immunisation programmes to address the concerns of women.

In light of the same, prioritising vaccine uptake of women, and addressing allied concerns, would be an important step towards enabling equitable access of vaccines and also improving public health outcomes at a macro level.

[26] Priyadarshini, Aliya Jasmine, 'Coverage survey of Measles-Rubella mass vaccination campaign in a rural area in Tamil Nadu', *Journal of Family Medicine and Primary Care*, (June 2019), available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6618239/ accessed on 20 July, 2022.
[27] Heidi J. Larson *et al.*, 'Measuring Vaccine Hesitancy: The development of a survey tool', *Vaccine*, (August 2015), available at: https://reader.elsevier.com/reader/sd/pii/S0264410X15005010?token=C040216199DF865E61A0678080873DE3593DEAC16EF90FE092A909EAEFB7FC26D761135C2F2246ED866DDCF176FEE1D5&originRegion=eu-west-1&originCreation=20220714060242 accessed on 20 July, 2022.
[28] Paula Y. Goodwin, Dean A. Garrett, *et al.*, 'Women and Family Health: The Role of Mothers in Promoting Family and Child Health, *International Journal of Global Health and Health Disparities*, (2005), available at: https://scholarworks.uni.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1023&context=ijghhd accessed on 27 October, 2022.
[29] Stephanie Zintel, Charlotte Flock, *et al.*, 'Gender Differences in the intention to get vaccinated against COVID-19: a systematic review and meta-analysis', *Journal of Public Health*, (January 2022) available at: https://link.springer.com/article/10.1007/s10389-021-01677-w accessed on 20 July, 2022.

2.Identifying Trends in Vaccine Hesitancy

2.1. *Health care and agency of women*

Gender norms produce a myriad of effects on women in matters relating to their health and access to health infrastructure.[30] These matters range from menstruation, mental well-being, maternity and senescence, amongst many others. Two prominent factors responsible for adverse effects on women's health condition are discriminatory actions committed against women inherently rooted in the social and cultural factors; and the specific behaviours exhibited by women due to structural factors, *inter alia*, age-based or occupation-based health conditions, educational qualifications and economic status.[31]

Figure 3

A 2020 study examining the specific effects of socio-cultural discrimination in relation to health care found that women and minority groups are more likely to delay or completely forgo seeking health care, because they perceive healthcare spaces such as hospitals and pharmacies as a setting with increased risk of discrimination.[32] Discrimination faced by these groups in the health care setting in the past has led to a learned practice of distrust.[33] A prominent example of how discrimination affects the ability of women to access healthcare services can be observed in the field of reproductive health services.[34] Access without discrimination to affordable quality contraception, including emergency contraception, holds great power to positively affect the quality of women's lives. At the same time, a stigmatised perception of the healthcare industry as a whole holds the power to cause serious harm.[35]

Studies examining structural factors suggest that age plays a crucial role in perceptions and actions taken by women regarding their own health. A study suggests that older women are more likely to forgo health services due to reasons including, but not limited to, weakening financial power, loss of agency and lack

[30] Ann M Weber, Beniamino Cislaghi, et al. 'Gender norms and health: insights from global survey data', *Gender Equality, Norms, and Health*, (June 2019), available at: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)30765-2/fulltext accessed on 20 July, 2022.
[31] Seemeen Sadat, 'How can we ensure women receive adequate health care as they age?', *World Bank Blogs*, (March 2018), available at: https://blogs.worldbank.org/health/how-can-we-ensure-women-receive-adequate-health-care-they-age ; See also: Marleen Temmerman, 'Women's health priorities and interventions', *the BMJ*, (September 2015), available at: 'https://www.bmj.com/content/bmj/351/bmj.h4147.full.pdf accessed on 20 July, 2022.
[32] Joshua G. Rivenbark and Mathieu Ichou, 'Discrimination in health care as a barrier to care: experiences of socially disadvantaged populations in France from a nationally representative survey', *BMC Public Health*, (January 2020), available at: https://bmcpublichealth.biomedcentral.com/track/pdf/10.1186/s12889-019-8124-z.pdf accessed on 20 July, 2022.
[33] Sarah Wamala, Juan Merlo, Gunnel Boström and Christer Hogstedt, 'Perceived discrimination, socioeconomic disadvantage and refraining from seeking medical treatment in Sweden', *Journal of Epidemiology & Community Health*, (April 2007), available at: https://jech.bmj.com/content/61/5/409 accessed on 20 July, 2022.
[34] Fiona Alderdice and Laura Kelly, 'Stigma and maternity care', *Journal of Reproductive and Infant Psychology*, (April 2019), available at: https://www.tandfonline.com/doi/full/10.1080/02646838.2019.1589758 accessed on 20 July, 2022.
[35] Esha Roy, 'Report: 67% abortions in India unsafe, cause nearly 8 deaths every day' *The Indian Express*, (March 2022) available at: https://indianexpress.com/article/india/india-unintended-pregnancy-abortion-7845655/ accessed on 14 October, 2022.

of research regarding geriatric female health care.[36] Studies also suggest that education plays a crucial role in access to health care for women.[37] Formal education grants women greater chances at achieving financial and social stability which may coalesce into a higher degree of agency over matters concerning health and access to healthcare services.[38]

The field of healthcare is highly prone to the issue of 'information asymmetry', wherein there is a high degree of disconnect between the information on which healthcare professionals operate and the information that the general public uses for the actions that they take.[39] Moreover, due to the multitude of stakeholders involved in this industry and the rapid pace of technological and scientific change that affects any disease or medical crisis, the receivers of healthcare are always running a race to catch up to the most relevant information about their health conditions. This issue is further aggravated for women in India, whose ability to access information in general is marred due to factors such as socio-economic background, age, and educational qualifications.[40] One such example of distortion in access to information was examined in the Mobile Gender Gap Report 2022. The report highlights that only 51% of women in India are aware of mobile internet as compared to 71% of men.[41] Lack of literacy, digital prowess, purchasing power and cognizance of relevance of internet services were highlighted as the main barriers to digital access for Indian women.[42] The digital gender divide is an indicator of women's lack of power to first, access information regarding their physical and mental health and second, navigate the healthcare system which is continually evolving through technology, to their benefit.[43]

The summation of the few issues listed above and many others faced by women in India have been reflected in the Global Gender Gap Report 2021. India ranked 145 out of 156 countries on the 'healthy life expectancy' index of the report.[44] The 'healthy life expectancy' index is calculated on the basis of factors *inter alia*, expectancy from health care and self-assessment of a disability free healthy life. It measures the quality of life lived, rather than the quantity of years lived.[45] It is crucial in assessing future and current health services and may also be used by public health officials in creating policies to address inequalities in health programs. Despite a continuous decline in the status of health and survival of women, even now methods and data to measure how gender inequality interacts with specific health

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[36] Beth Kosiak, Judy Sangl and Rosaly Correa-de-Araujo, 'Quality of health care for older women: what do we know?', *Women's Health Issues*, (March 2006), available at: https://pubmed.ncbi.nlm.nih.gov/16638525/ accessed on 20 July, 2022.

[37] Dai Binh Tran, et al. 'The influence of education on women's well-being: Evidence from Australia', *Plos One*, (March 2021), available at: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0247765 accessed on 20 July, 2022.

[38] Shibu John and Prerna Singh, 'Female Education and Health: Effects of Social Determinants on Economic Growth and Development, *International Journal of Research Foundation of Hospital and health care Administration*, (2017), available at: https://www.jrfhha.com/doi/pdf/10.5005/jp-journals-10035-1081 accessed on 20 July, 2022. See also: Mohammad Mafizur Rahman and Khosrul Alam, 'The role of access to electricity, female education, and public health expenditure on female health outcomes: evidence from SAARC-ASEAN countries', *BMC Women's Health*, (November 2021), available at: https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-021-01520-0 accessed on 20 July, 2022.

[39]Martin Kruz and Ranjan Kini, 'The Effect of Information Asymmetry on Consumer Driven Health Plans' *IFIP International Federation for Information Processing, Volume 251, Integration and Innovation Orient to E-Society Volume I*, (October 2007) available at: https://link.springer.com/content/pdf/10.1007/978-0-387-75466-6_40.pdf accessed on 02 November, 2022.

[40]Mukelani Dimba ' Access to information as a tool for socio-economic justice' *Pambazuka News*, (April 2008) available at: https://www.pambazuka.org/security-icts/access-information-tool-socio-economic-justice accessed on 15 October, 2022.

[41] Matthew Shanahan, 'The Mobile Gender Gap Report 2022', *GSMA*, P. 37, (June 2022) available at:https://www.gsma.com/r/wp-content/uploads/2022/06/The-Mobile-Gender-Gap-Report-2022.pdf accessed on 20 July, 2022.

[42] Matthew Shanahan, 'The Mobile Gender Gap Report 2022', *GSMA*, P. 42, (June 2022) available at:https://www.gsma.com/r/wp-content/uploads/2022/06/The-Mobile-Gender-Gap-Report-2022.pdf accessed on 20 July, 2022. See also: 'Digital literacy remains a concern as most Indian women have never used the Internet', *The Economic Times*, (December 2020), available at: https://economictimes.indiatimes.com/magazines/panache/digital-literacy-remains-a-concern-as-most-indian-women-have-never-used-the-internet/articleshow/79736857.cms?from=mdr accessed on 20 July, 2022. See also: Mitali Nikore and Ishita Uppadhyay, 'India's gendered digital divide: How the absence of digital access is leaving women behind', *Observer Research Foundation*, (August 2021), available at: https://www.orfonline.org/expert-speak/indias-gendered-digital-divide/ accessed on 20 July, 2022.

[43] 'Why does Digital Health play an important role in revolutionising health care for Women?', *Wealthy Therapeutics*, (March 2022), available at: https://www.wellthytherapeutics.com/blog/why-does-digital-health-play-an-important-role-in-revolutionizing-health care-for-women/ accessed on 20 July, 2022.

[44]'Global Gender Gap Report 2021', *World Economic Forum*, (March 2021), P. 217 available at: https://www3.weforum.org/docs/WEF_GGGR_2021.pdf accessed on 20 July, 2022.

[45]Matthew C Stiefel, Rocco J Perla, and Bonnie L Zell, 'A Healthy Bottom Line: Healthy Life Expectancy as an Outcome Measure for Health Improvement Efforts' *The Milbank Quarterly*, (March 2010) available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2888015/ accessed on 20 July, 2022.

issues remain underdeveloped. Arguably, though gender inequality may be conclusively read as a theme into the language of health services, we do not have the alphabet to coherently decipher it.[46]

2.2. *Response of women to immunisation programmes*

2.2.1. Illustrations of response to immunisation programmes: One aspect of gender inequality prevalent in the health sector is the way in which women react to situations and perceptions around immunisation i.e., vaccine hesitancy. A 2013 study tracked vaccine hesitancy trends of pregnant women in response to the influenza vaccination mandate of the German government and found that only 23% of the pregnant women population had gotten vaccinated over a period of three years. Major reasons for resisting vaccines were found to be lack of confidence in the research of the vaccine and the perception that the vaccine was not necessary for their maternal well-being. The study suggested that a higher vaccine uptake could have been achieved by tailoring programmes to improve knowledge of why the vaccination is necessary as well as its pinpointed benefits for not just pregnant women but for women in general.[47] The benefit of information packets and logistics tailored for women was also seen as a key factor in the Nigerian poliovirus eradication programme. The country was able to eradicate poliovirus by employing women vaccination personnel who were particularly sensitised about the benefits of vaccination.[48] It is important to note that although poliovirus was not a women-specific issue, the Nigerian study and the employment of the same policy in delivering COVID-19 vaccines, exhibits how targeted programmes for education, sensitisation and training of women in relation to their and their family's health can amplify the overall success of immunisation programmes in the community.

2.2.2. Lack of extensive and timely scientific research: Another factor for vaccine hesitancy is the lack of available scientific data regarding possible adverse side-effects of vaccines for women in general. Before any vaccine is released in the market, it undergoes rigorous clinical trials to assess probable risks and consequences on the health of the receiver of the vaccines. However, some studies suggest that the specific risks regarding the health of pre-and post-natal women, are more often than not calculated with incomplete or limited data[49] or the information about their risks are circulated only after the vaccines have been released or mandated to the public.[50] Such a trend, coupled with the fact that a woman's body remains in constant hormonal and physiological influx from a young age, creates fertile ground for vaccine hesitancy whenever a new vaccine is introduced. Moreover, women have been proven to be more susceptible to certain diseases *inter*

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[46] Danielle Xiaodan Morales, Tyler Fox Beltran and Stephanie Alexandra Morales, 'Gender, socioeconomic status, and COVID-19 vaccine hesitancy in the US: An intersectionality approach', *Sociology of Health and Illness*, (May 2022), available at: https://onlinelibrary.wiley.com/doi/full/10.1111/1467-9566.13474 accessed on 20 July, 2022.

[47] Bierte Bodekar, Dietman Walter, et al, 'Cross-sectional study on factors associated with influenza vaccine uptake and pertussis vaccination status among pregnant women in Germany', *Vaccine*, (July 2014), available at: https://www.sciencedirect.com/science/article/pii/S0264410X14007968 accessed on 20 July, 2022.

[48] 'Gender-responsive support from Nigeria's polio eradication programme to tackle COVID-19 vaccine hesitancy', *World Health Organization*, (April 2022), available at: https://www.afro.who.int/countries/nigeria/news/gender-responsive-support-nigerias-polio-eradication-programme-tackle-covid-19-vaccine-hesitancy accessed on 20 July, 2022.

[49] Elyse O. Kharbanda, Jacob Haapala, Malini DeSilva, et al, 'Spontaneous Abortion Following COVID-19 Vaccination During Pregnancy, *JAMA*, (September 2021), available at: 'https://jamanetwork.com/journals/jama/fullarticle/2784193 accessed on 20 July, 2022. See also: Tom T. Shimabukuro et al., 'Preliminary Findings of mRNA Covid-19 Vaccine Safety in Pregnant Persons', *The New England Journal of Medicine*, (June 2021), available at: https://www.nejm.org/doi/full/10.1056/nejmoa2104983 accessed on 20 July, 2022.

[50] Pregnant women should be informed about the benefits, risks and likely side effects of vaccines: Govt', *The Economic Times*, (July 2021), available at: https://economictimes.indiatimes.com/news/india/pregnant-women-should-be-informed-about-benefits-risks-and-likely-side-effects-of-vaccine-govt/articleshow/84073553.cms accessed on 20 July, 2022; See also: U.S. Department of Health and Human Services, 'COVID-19 vaccines linked to small increase in menstrual cycle length', National Institute of Health Research Matters, (January 2022), available at: https://www.nih.gov/news-events/nih-research-matters/covid-19-vaccines-linked-small-increase-menstrual-cycle-length accessed on 03, October, 2022; See also: Victoria Male, 'Menstrual changes after covid-19 vaccination' BMJ (September 2021), available at: https://www.bmj.com/content/374/bmj.n2211 accessed on 03 October, 2022.

alia, cancer,[51] osteoporosis,[52] cardiovascular diseases,[53] depression[54] and urinary tract problems,[55] which should be addressed and satisfactorily mapped during trials before introducing a vaccine to the public.

The responses of women to immunisation depend on factors such as phases of their health, age, financial power, education and their sociocultural position in the community. These factors produce unique results in every case, meaning that any previous study on vaccine hesitancy of women for other vaccines may not adequately address concerns which may arise in respect to future vaccines. Thus, to tailor a comprehensive and robust public immunisation policy, separate targeted granular studies must be conducted to identify and consistently address the specific concerns of women.[56]

2.3. *Response to COVID-19 vaccines in India*

2.3.1. Studies conducted to examine the response of COVID-19 vaccines in India: In India, fatality rates rose significantly during the second wave of the COVID-19 pandemic. The number of infections in Delhi witnessed a steep rise wherein cases increased from 2,000 to 20,000 between March 31 and April 16, 2021[57] and the number of deaths reached up to 4,475 per day.[58] Despite the rollout of the COVID-19 vaccine starting in January 2021,[59] unclear public preferences and attitudes towards the vaccine aggravated vaccine hesitancy among the public such that it was noted in June 2021 that 58% of the unvaccinated population could be vaccine hesitant.[60]

After the rollout of COVID-19 vaccines, the government accorded primacy to frontline workers, including healthcare workers and medical students, in receiving the vaccine.[61] Thereafter, a number of studies were conducted to document vaccine hesitancy among these groups and make the first attempt at understanding the underlying factors. A May 2021 study concluded that a mechanism to increase vaccine confidence was to lay focus on promoting official sources of information as a measure to counter apprehension generated through widespread dissemination of false information on social media.[62] A March 2022 study found that concerns regarding the safety and efficacy of the vaccine was the most commonly cited reason for hesitancy to take the

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[51] Dr. Flavia Bustreo, 'Ten top issues for women's health', *World Health Organisation*, (February 2015) available at: https://www.who.int/news-room/commentaries/detail/ten-top-issues-for-women%27s-health; See also: 'Cancer in India: Are women more affected than men?', *Medanta*, (April 2019) available at: https://www.medanta.org/patient-education-blog/cancer-in-india-are-women-more-affected-than-men/ accessed on 20 July, 2022.

[52] 'Why are women at higher risk than men for heart disease?', *Beaumont*, (2022) available at: https://www.beaumont.org/health-wellness/blogs/why-are-women-at-higher-risk-than-men-for-heart-disease; See also: 'Gender matters: Heart diseases risk in women', *Harvard Health Publishing*, *Harvard Medical School*, (March 2017), available at: https://www.health.harvard.edu/heart-health/gender-matters-heart-disease-risk-in-women accessed on 20 July, 2022.

[53] Khaled A. Alswat, 'Gender Disparities in Osteoporosis', *Journal of Clinical Medicine Research*, (May 2017) available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5380170/ accessed on 20 July, 2022.

[54] Paul R. Albert, 'Why is depression more prevalent in women?', *Journal of Psychiatry and Neuroscience*, (July 2015) available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4478054/

[55] Kim Huston, 'Blame your anatomy: women are more prone to UTI than men', *Norton health care*, (April 2018) available at: https://nortonhealth care.com/news/uti-ecare/ accessed on 20 July, 2022.

[56] Sarah Payne, 'How can gender equity be addressed through health systems?', *Health systems and policy analysis*, (2009) available at: https://www.euro.who.int/__data/assets/pdf_file/0006/64941/E92846.pdf accessed on 20 July, 2022.

[57] Anuradha Mascarenhas, 'Second wave of COVID-19 in delhi fuelled by delta, highlights challenge of reaching herd immunity', *The Indian Express*, (July 2022) available at: https://indianexpress.com/article/cities/delhi/delhi-covid-19-outbreak-research-delta-variant-7573056/ accessed on 20 July, 2022.

[58] 'India tops the world in single-day Covid-19 fatalities', *The Hindu*, (May 2021) available at: https://www.thehindu.com/data/data-india-tops-the-world-in-single-day-covid-19-fatalities/article34606529.ece accessed on 20 July, 2022.

[59] Brian Alfred Boye, 'COVID-19 Vaccine launch in India' UNICEF (2021) available at: https://www.unicef.org/india/stories/covid-19-vaccine-launch-india accessed on 07 November 2022.

[60] '33 crore Indian adults may currently be hesitant to take the COVID vaccine', *Local Circles*, available at: https://www.localcircles.com/a/press/page/vaccine-willingness-survey#.Yr6Whr3P3IU accessed on 20 July, 2022.

[61] Brian Alfred Boye, 'COVID-19 Vaccine launch in India' UNICEF (2021) available at: https://www.unicef.org/india/stories/covid-19-vaccine-launch-india accessed on 07 November 2022.

[62] Jyoti Jain, *et al.*, 'COVID-19 vaccine hesitancy among medical students in India', *Cambridge University Press*, (May 2021) available at: https://pubmed.ncbi.nlm.nih.gov/34011421/ accessed on 20 July, 2022.

vaccine. Convenience related hesitancy i.e., the belief that the vaccination could be skipped on account of developing herd immunity and voluntary uptake was also an important reason for delaying the vaccination.[63] In another study, three factors found to be most closely associated with COVID-19 vaccine hesitancy were: (1) concerns about vaccination effectiveness for disease prevention; (2) concerns about adverse effects of the vaccine; and (3) low perceived disease severity.[64]

2.3.2. Key findings on factors affecting vaccine hesitancy: Studies conducted to understand the plausible causes of vaccine hesitancy found that apprehensions were mostly centred around the fact that the vaccine had not been tested rigorously enough to determine its adverse effects and long-term efficacy.[65] New reports about probable shortage of vaccines in India also played a part in the public perception of trust in the government and public behaviour towards the vaccines.[66] Shifting of blame between state and central governments[67] and the erratic supply of vaccines in most states coupled with disrupted scheduled appointments on the CoWin platform also led to disproportionate access to vaccines wherein those with better access to the internet were among the first to receive the vaccination.[68] Another factor that affected the perception regarding vaccines in India was the misinformation surrounding the efficacy and side-effects of the vaccine. Rumours concerning impotence among men, infertility among women, DNA chips being administered instead of vaccines, and lack of public health infrastructure further exacerbated hesitancy.[69] The willingness of the public to accept vaccines was found to be non-static and highly dependent on public sentiments about COVID-19 vaccines.[70]

2.3.3. Women's response to COVID-19 vaccines in India: Lack of access to credible sources of information and rampant misinformation concerning the COVID-19 vaccines made women more susceptible to vaccine hesitancy in India.[71] Reported male bias during vaccine trials further fuelled suspicion about the suitability of vaccines for women, especially in light of sex-based immunological responses.[72]

In a study concerning health care workers, vaccine hesitancy in women was found to be higher in comparison to their male counterparts as more women were worried about the safety and efficacy of the vaccine.[73] The biggest factor for vaccine hesitancy in women, and especially prenatal

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[63] Mitasha Singh, *et al.*, 'Prevalence and determinants of vaccine hesitancy for coronavirus disease 2019 vaccine among health care workers of tertiary care center in North India', *Asian Journal of Medical Sciences*, (March 2022) available at: https://www.researchgate.net/publication/358936116_Prevalence_and_determinants_of_vaccine_hesitancy_for_coronavirus_disease_2019_vaccine_among_health care_workers_of_tertiary_care_center_in_North_India accessed on 20 July, 2022.

[64] Nikhil Singhania, Sanjana Kathiravan, Ashok K. Pannu, 'Acceptance of coronavirus disease 2019 vaccine among health-care personnel in India: a cross-sectional survey during the initial phase of vaccination', *Elsevier Public Health Emergency Collection*, (July 2021) available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8010326/ accessed on 20 July, 2022.

[65] Jyoti Jain, Suman Saurabh *et al.*, 'Covid-19 vaccine hesitancy among medical students in India', *Cambridge University Press Public Health Emergency Collection*, (May 2021) available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8185413/ accessed on 20 July, 2022.

[66] Vanita Shrivastava and Subhra Priyadarshini, 'Vaccine shortage dents India's coronavirus adult immunisation drive', *Nature India*, (April 2021) available at: https://www.nature.com/articles/nindia.2021.63 accessed on 20 July, 2022.

[67] 'Revised guidelines for implementation of national COVID vaccination program', available at: https://www.mohfw.gov.in/pdf/RevisedVaccinationGuidelines.pdf accessed on 20 July, 2022.

[68] Ravi Duggal, 'Covid-19 in India: vaccine shortages are leading to discrimination in access', *the BMJ Opinion*, (August 2021) available at: https://blogs.bmj.com/bmj/2021/08/10/covid-19-in-india-vaccine-shortages-are-leading-to-discrimination-in-access/ accessed on 20 July, 2022.

[69] Shruti Menon, 'India Covid-19: Misleading claims shared about vaccines', *BBC News*, (January 2021) available at: https://www.bbc.com/news/55768656 accessed on 20 July, 2022.

[70] Archana Kumari, Piyush Ranjan *et al.*, 'What Indians think of the COVID-19 vaccine: a qualitative study comprising focus group discussions and thematic analysis', *Elsevier Public Health Emergency Collection*, (March 2021) available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7997146/ accessed on 20 July, 2022.

[71] Chinki Sinha, 'Covid India: women in rural Bihar hesitant to take vaccines', *BBC News*, (July 2021) available at: https://www.bbc.com/news/world-asia-india-57551345 accessed on 20 July, 2022.

[72] Sophie Harman, *et al.*, 'COVID-19 vaccines and women's security', *The Lancet*, (December 2020) available at: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)32727-6/fulltext accessed on 20 July, 2022.

[73] G. Swetha Rao, R. Ram, B. Vengamma, 'Reasons for hesitancy to take COVID-19 vaccine: A survey amongst health care workers', *Journal of Clinical and Scientific Research*, (February 2022) available at: https://www.jcsr.co.in/article.asp?issn=2277-5706;year=2022;volume=11;issue=1;spage=17;epage=21;aulast=Rao accessed on 20 July, 2022.

women, was the lack of data about the safety of the vaccines for the female body and possibility of harm to the foetuses.[74] The difference in the level of hesitancy was observed in relation to the stage of pregnancy wherein women in the second and third trimesters of their pregnancy reported higher vaccine hesitancy as compared to women in the first trimester.[75]

2.3.4. Relevance of Official Communications: The perception of women towards the vaccine was also affected by the fact that the official communique regarding the safety of vaccines for pregnant women came four months after the first stage of vaccine rollouts. The Indian government did not recommend the administration of vaccines to pregnant women[76] until July 25, 2021[77] when Operational Guidelines for COVID-19 Vaccination of Pregnant Women[78] stated that the benefits of vaccinating pregnant women were greater than possible risks the vaccination posed to them. Owing to the fact that one of the primary sources of reliable information on issues of wide-spread relevance are organs of the Government, [79] the lack of clarity displayed by the Central and State Governments during the first and second waves may have been responsible for a reduced level of trust in the information circulated by them at later stages, consequently affecting the perception of the vaccines amongst women.

[74] Sule Goncu Ayhan *et al*., 'COVID-19 vaccine acceptance in pregnant women', *International Journal of Gynaecology & Obstetrics*, (April 2021) available at: https://pubmed.ncbi.nlm.nih.gov/33872386/ accessed on 20 July, 2022.
[75] Sule Goncu Ayhan *et al*., 'COVID-19 vaccine acceptance in pregnant women', *International Journal of Gynaecology & Obstetrics*, (April 2021) available at: https://pubmed.ncbi.nlm.nih.gov/33872386/ accessed on 20 July, 2022.
[76] 'New Recommendations of NEGVAC accepted by Union Ministry of Health', *Press Information Bureau*, (May 2021) available at: https://pib.gov.in/PressReleasePage.aspx?PRID=1719925; See also: Neetu Chandra Sharma, 'Who recommends jabs for pregnant women, but India is still cautious', *Livemint*, (June 2021) available at: https://www.livemint.com/news/world/who-recommends-covid-19-vaccination-for-pregnant-women-11623669699845.html accessed on 20 July, 2022.
[77] Abhilash Gaur, 'With nod for vaccine in pregnancy, crore of families will breathe easily', *Times of India*, (June 2021) available at: https://timesofindia.indiatimes.com/india/with-nod-for-vaccine-in-pregnancy-crores-of-families-will-breathe-easy/articleshow/83941021.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst accessed on 20 July, 2022.
[78] 'Operational guidance for COVID-19 vaccination of pregnant women', *Ministry of Health and Family Welfare*, available at: https://www.mohfw.gov.in/pdf/OperationalGuidanceforCOVID19vaccinationofPregnantWoman.pdf accessed on 20 July, 2022.
[79] Enhancing public trust in COVID-19 vaccination: The role of governments', *OECD Policy Response to Coronavirus (Covid-19)*, available at: https://www.oecd.org/coronavirus/policy-responses/enhancing-public-trust-in-covid-19-vaccination-the-role-of-governments-eae0ec5a/ accessed on 20 July, 2022.

3. Research Methodology

3.1. *Methodology*

For the purpose of this study, a questionnaire was designed to assess COVID-19 vaccine related hesitancy and other factors such as knowledge, perceptions and willingness to take the vaccine in the female adult population in Delhi (**Annexure-A**). A comprehensive review of the existing literature on the subject was undertaken to design the questionnaire.

The questionnaire included a total of 54 questions and sought to capture the respondents' attitude towards COVID-19 vaccines. The questionnaire's framework was divided into three parts corresponding to the 3C's i.e., *convenience*, *complacency* and *confidence*. Other questions were aimed at understanding the main sources of information relating to the vaccine and possible determinants which influence respondents to take the vaccine. For instance, the respondents were asked whether their uptake of the vaccine was influenced by government policies mandating vaccination or guidelines issued by their employers in this regard. Gender-specific questions were designed to gauge the perception of women on how the vaccine could affect their menstrual cycles or lactation among pregnant women.

An external agency specialising in the arena of data collection and research was engaged for the purpose of surveying respondents based on the questionnaire. The questionnaire was administered in person by Morsel from February 21, 2022 to March 5, 2022. The survey questionnaire was drafted both in English and Hindi for better outreach in light of the target population.

A total of 1018 women were surveyed across 5 locations in Delhi i.e., Kotla Mubarakpur, Nizamuddin (Jangpura), Paschim Vihar, Seelampur, and Jamia Nagar with an objective of understanding their perceptions towards the COVID-19 vaccine. These areas were chosen to maintain heterogeneity in the sample population for demographics such as religion, caste and age.

- Kotla Mubarakpur located in South Delhi is a non-regularised colony primarily populated by Hindus and Muslims.
- Nizamuddin, located in Central Delhi, is largely populated by Muslims. For the purpose of data collection, only non-regularised areas of Nizamuddin were selected.
- Paschim Vihar located in West Delhi consists of regularised colonies largely populated by the Hindu community.
- Jamia Nagar located in South-East Delhi is non-regularised and is primarily populated by Muslims.
- Seelampur is located in East Delhi and was chosen due to its semi-urban demographic.

Convenience sampling method was employed by the data collection agency to identify adult women in these areas who were willing to participate in the assessment. The respondents were given a brief overview of the objective of the study and their consent was obtained prior to recording their response.

Results are presented as descriptive statistics.

3.2. *Sample Description and Demographic Factors*

It was found that the majority i.e., 88.9% of the respondents had received at least one dose of the vaccine at the time of the survey wherein 74.36% of the respondents were fully vaccinated. Since the survey was conducted between February and March 2022, the COVID-19 vaccination drive had already gained sufficient coverage and momentum in the country. Hence, for the purpose of this study, vaccine

hesitancy is being viewed from an interrogative position of analysing whether factors which indicate hesitancy continue to exist among respondents despite their uptake of the vaccination.

We have also additionally considered whether the responses of respondents on these key factors differ on account of their socio-economic and demographic background such as caste, educational background, financial status etc. The various sources of information where the respondents procured information about the COVID-19 vaccines has also been analysed in detail.

Delhi was chosen as the site of study. It has a population of 1.68 Crores which comprises 76 lakh women.[80] According to the data drawn from the CoWin portal, 954 women were vaccinated for every 1,000 men in India. The corresponding gender gap in vaccination rates among metro cities in India was a concern since it was significantly larger than the gap at the national level.[81] The gender gap in vaccination rates in Delhi was 742 females for every 1,000 males and was found to be the 5th lowest in the country.[82]

The sample description of the respondents interviewed for the purpose of this study is as follows:

Age: The mean age of the respondents was found to be 30.3 years.

Marital Status: A majority of the respondents i.e., 80.84% were married at the time of conducting the survey.

Religion: A large number of the respondents were Hindu at 78.19%, whereas 18.76% were Muslims. In the sample, other religious groups, including Christian and Sikh, were only 3.05%.

Caste: 45.97% of the respondents belonged to the General category, 22.5% were Other Backward Castes (OBC), 24.36% were Scheduled Castes (SC), 5.50% were Scheduled Tribes (ST) and 1.67% chose the option 'Other'.

Educational Background: Within the sample, 31.24% of the respondents had no formal education whereas 9.92% had attended school up to 5th standard. 34.18% of the respondents had been educated up to the 10th standard and 15.82% up to 12th standard. In terms of higher education, only 8.84% of the respondents were graduates, post-graduates or doctoral degree-holders.

Educational Background of the Respondents' Spouses: For married respondents, an enquiry was also made into the educational qualification of their spouses. It was found that 23.96% of the spouses had no formal education whereas 11.75% had attended school up to the 5th standard. 42.97% had attained education until the 10th standard and 12.33% up to 12th standard. Only 8.99% were graduates, post-graduates or doctoral degree holders.

Financial Independence: Out of the respondents, 35.95% stated that they were financially independent.

3.3. *Data Collection*

[80]Delhi Population 2011-22, available at: https://www.census2011.co.in/census/state/delhi.html accessed on 02 November, 2022.
[81] Rupsa Chakraborty, 'Metros show gender gap in Covid-19 vaccination, more men get jabbed', *The Indian Express*, (January 2022) available at: https://indianexpress.com/article/india/india-covid-vaccination-gender-gap-metros-7732512/ accessed on 20 July, 2022.
[82] 'F. M. vaccination ratios', available at: https://drive.google.com/file/d/1HMElMgjYBGM7yirN4pCP5GV_V-CIVC5s/view accessed on 20 July, 2022.

The data for this study has been collected on the metric of 3C's which has been detailed below. Based on existing literature, it was expected that lower educational levels, lack of financial independence and other socio-economic disadvantages would contribute to higher levels of vaccine hesitancy in women.

3.3.1. Convenience

Convenience plays a significant role in influencing vaccination uptake when physical availability, affordability and geographical accessibility of the vaccines, among other factors, affect the decision to be vaccinated.[83]
For the purpose of understanding hesitancy stemming from *convenience*, the respondents were asked questions such as whether access to the vaccine was restricted due to lack of physical availability, affordability or delivery of the vaccines.

The respondents were also asked questions about the ease of accessing and availing the vaccine in their locality. The responses were recorded on a five-point Likert scale from "Very difficult" to "Very easy". Due to the low percentage of responses on the options of "Very difficult" and "Somewhat difficult", the scale was reduced to a three-point Likert scale from "Difficult" to "Easy", for the purpose of analysis.

The key variables for assessing the *convenience* in response to the COVID-19 vaccine were aggregated by the descriptive responses to 'how likely are you to get vaccinated if a centre opens within 50m of your home?'; 'how easy was it for you to reach the vaccination centre in your locality?'; and 'how difficult did you find the process of getting vaccinated?'. The questions and statements were further compared within sub-groups based on the marital status of the respondents, their level of educational qualification, degree of financial dependence and their religion as well as caste.

3.3.2. Complacency

Complacency, in the context of vaccine hesitancy, refers to the belief that the vaccine preventable disease is not serious and the vaccine is not necessarily required to prevent infection or transmission.[84]
In the context of COVID-19, complacency may have developed in the early stages of the pandemic when transmission levels were low and the effects of the virus on the human body had not been adequately studied or examined.

The key variables for assessing the complacency levels of women in response to COVID-19 vaccine were aggregated by the descriptive responses to 'do you believe that COVID-19 is life-threatening?';'I will take the COVID-19 vaccine only if it is made mandatory for me by the Government', and 'I will take the COVID-19 vaccine only if it is made mandatory for me by my employer'. The questions and statements were further compared within sub-groups based on the marital status of the respondents, their level of educational qualification, degree of financial dependence and their religion as well as caste.

3.3.3. Confidence

Confidence factors associated with vaccine hesitancy commonly include mistrust in benefits of the vaccine, concerns about commercial profiteering and preference for natural immunity.[85]

[83] Noni E. MacDonald, 'Vaccine hesitancy: definition, scope and determinants', *Vaccine*, (August 2015) available at: https://www.sciencedirect.com/science/article/pii/S0264410X15005009?via%3Dihub accessed on 20 July, 2022.
[84] P. Gerretsen, J. Kim, *et al.*, 'Individual determinants of COVID-19 vaccine hesitancy', *Plos One*, (November 2021) available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8598046/ accessed on 20 July, 2022.
[85] P. Gerretsen, J. Kim, *et al.*, 'Individual determinants of COVID-19 vaccine hesitancy', *Plos One*, (November 2021) available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8598046/ accessed on 20 July, 2022.

The key variables for assessing the confidence levels of women in response to COVID-19 vaccine were aggregated by the descriptive responses to 'do you agree that COVID-19 vaccines can be harmful for pregnant or lactating women?'; and 'how concerned are you about the risk in terms of side effects and serious adverse events from the currently available COVID-19 vaccines?'. The questions and statements were further compared within sub-groups based on the marital status of the respondents, their level of educational qualification, degree of financial dependence and their religion as well as caste.

3.4. *Limitations*

The sample consisted of 1,018 women from 5 locations in New Delhi, i.e., Kotla Mubarakpur, Nizamuddin, Paschim Vihar, Seelampur, and Jamia Nagar. It was envisaged that surveying women from these areas would provide a varied sample in terms of multiple demographic factors. However, the sample predominantly comprised women from lower and middle-income groups, at the exclusion of women from higher income groups. Therefore, the perceptions of women belonging to higher income groups could not be examined as a part of this study.

Further, since this study was conducted in February 2022, after the COVID-19 vaccination drive had gained sufficient momentum, most of the respondents had already been vaccinated at the time of responding to our questions. By this time, there was also widespread dissemination of information relating to the virus and its multiple variants. Owing to this, it is possible that initial attitudes of hesitancy towards the vaccination could have transformed into acceptance thereafter.

February 2022 also witnessed the onset of a third wave of COVID-19 due to the spread of the omicron variant which subsequently resulted in a lockdown.[86] Some enumerators carrying out the survey observed that the male members of the respondents' family remained present in the vicinity of the respondent during the data collection exercise. It is possible that their presence might have made the respondents hesitant in answering questions concerning taboo topics such as menstrual health and pregnancy. The enumerators also reported instances where male members took over the conversation and answered questions at the behest of the respondent. It is probable that this could have led to discrepancies in the responses collected.

The enumerators additionally reported that in Nizamuddin, the residents strongly objected to the data collection exercise. The residents deemed the survey as a political survey that was being strategically conducted by the Government of India with ulterior motives to harm their community. As a result of the mistrust, the data collection exercise was disrupted at that location and had to be conducted in Jangpura.

[86] Government of NCT of Delhi, Delhi Disaster Management Authority, Order No. F.60/DDMA/COVID-19/2021/509 (January 11, 2022), available at: http://ddma.delhigovt.nic.in/wps/wcm/connect/2a285c80458d98c5bb92ff6876edb3cf/DDMA+order+no+509+dt+11.01.21-compressed.pdf?MOD=AJPERES&lmod=1208278712&CACHEID=2a285c80458d98c5bb92ff6876edb3cf accessed on 2 November, 2022.

4. Observations and Findings based on the 3C's model

As noted in the foregoing chapter, this study has employed the 3C's metric to measure vaccine hesitancy among the sample. Consequently, the observations and findings of the survey have also been organised on the same metric. Each 'c', i.e., *convenience*, *complacency* and *confidence*, has been further analysed on the basis of questions asked and thereafter observations at the sub-group level have been recorded.

4.1. *Convenience*

4.1.1. Ease of finding vaccination centres

When the respondents were asked how easy they found reaching the vaccination centre in their locality, 91.55% stated that they found it easy whereas 4.91% respondents stated that they found it difficult. 3.54% of the respondents reported that they were unsure.

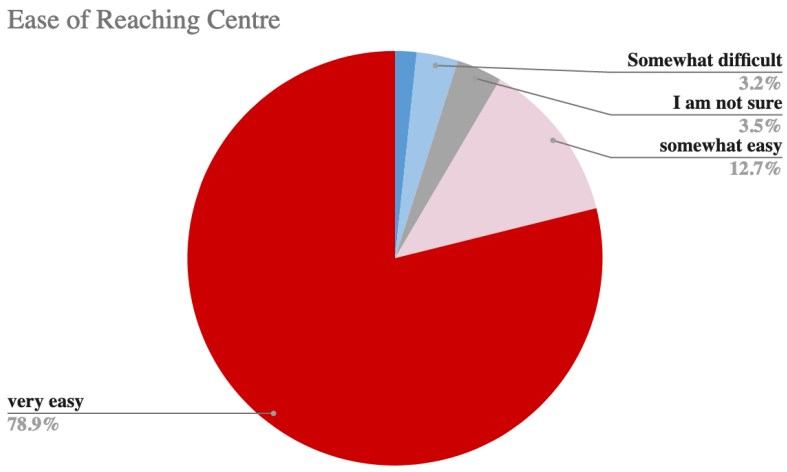

Figure 4

Educational background: 87.11% women with no formal education and 90.1% women with schooling up to 5th standard reported that they found it easy to reach the vaccination centre. On the other hand, approximately 94% of women with schooling up to 12th standard and 93.33% of women who were graduates and above reported that they found it easy to reach the vaccination centre. It may be argued that the educational qualification level of women played a part in their perception and experience of ease in reaching the centre. The fact that the allotment of centres for receiving vaccines has been operationalised through the CoWin website, which requires a certain degree of literacy both educational and digital, may also be indicative of the barriers faced by women in accessing vaccination centres.

Respondent Educational Levels	No formal schooling	Up to 5th standard	Up to 10th standard	Up to 12th standard	Undergrad and above
Difficult	7.55	5.94	3.16	3.73	3.33
Not Sure	5.35	3.96	2.59	1.86	3.33
Easy	**87.11**	**90.1**	94.25	94.41	93.33

Religion: 6.81% Muslims and 4.65% Hindus indicated that they found it difficult to reach the vaccination centre.

Religion	**Hindu**	**Muslim**
Difficult	4.65	**6.81**
Not Sure	3.64	3.66
Easy	91.71	**89.53**

Caste: 92.31% respondents belonging to the General category reported that they found it easy to reach the vaccination centre, whereas among OBCs only 89.96% women did. The percentage of women from OBC households that found reaching the vaccination centre easy, was marginally lower than that among women from the SC category (91.53%) and ST category (94.64%). Fewer women from OBC households reported that reaching the vaccination centre was easy compared to all three categories of non-OBC households. On the other hand, more ST households reported finding reaching the centre easy as compared to other three categories of non-ST households.

Caste	General	OBC	SC	ST
Difficult	5.13	4.8	5.65	1.79
Not Sure	2.56	5.24	2.82	3.57
Easy	92.31	**89.96**	91.53	**94.64**

4.1.2. Process of Vaccination

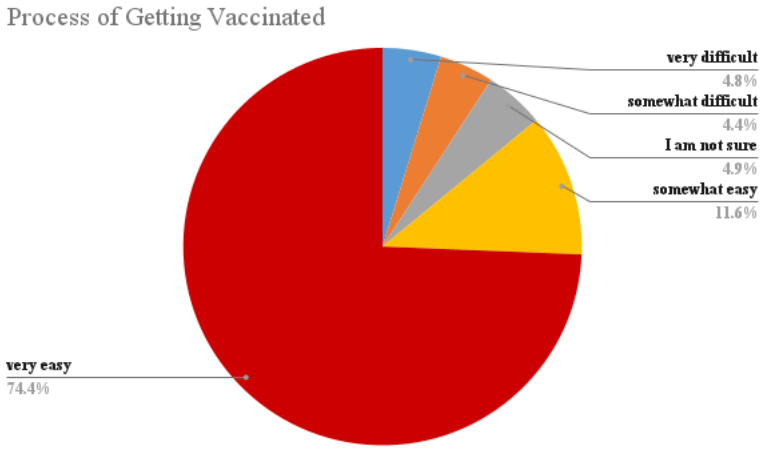

Figure 5

Out of a total of 905 vaccinated respondents, 85.97% reported that they found the process of getting vaccinated easy. Only 9.17% reported that the process was difficult whereas 4.86% were unsure.

Marital status: It was observed that married women found the process of getting vaccinated more difficult than the rest of the sample i.e., 10.12% of married women found the process of getting vaccinated difficult, as compared to 9.17% of women from the full sample.

Educational background: More women with schooling of 5th standard and above reported finding the vaccination process easier as compared to women with education level below the 5th standard. It was also observed that the percentage of women who found the process of vaccination easy increased marginally with the level of education – 79.78% (no formal education); 81.4% (schooling up to 5th standard); 88.03% (schooling up to 10th standard); 89.86% (schooling up to 12th standard) and 96.47% (graduate and above).

Respondent Educational Levels	No formal schooling	Up to 5th standard	Up to 10th standard	Up to 12th standard	Undergrad and above
Difficult	**11.19**	**13.95**	8.74	6.76	3.53
Not Sure	9.03	4.65	3.24	3.38	0
Easy	**79.78**	**81.4**	88.03	89.86	**96.47**

Religion: 10.26% respondents belonging to Muslim households reported that they found the process of obtaining the vaccination difficult as compared to 9.04% women from Hindu households and 6.67% women belonging to other religions.

Religion	Hindu	Muslim	Other
Difficult	9.04	**10.26**	6.67
Not Sure	5.01	4.49	3.33
Easy	85.95	85.26	90

Caste: It was found that more ST households (18.75%) found the vaccination process difficult as compared to non-ST households. In terms of ease of the process, 87.85% respondents from the General category; 82.18% from the OBC category, 89.15% from the SC category and 72.92% belonging to the ST category found the process to be easy.

Caste	General	OBC	SC	ST
Difficult	8.88	**10.4**	6.6	**18.75**
Not Sure	3.27	7.43	4.25	8.33
Easy	**87.85**	82.18	**89.15**	**72.92**

Age: The mean age of women who reported to find the vaccination process difficult was 32.1 years as compared to women with a mean age of 30.46 years who reported ease of process. Hence, the level of difficulty was observed to be marginally higher in women who were older.

4.1.3. Distance between vaccination centre and house

The distance of the vaccination centre from the house of the respondent had a strong impact on the willingness to get vaccinated. 89.39% of the total sample stated that they were likely to get vaccinated if a vaccination centre was within 50m of their home whereas only 6.48% reported that they were still unlikely to get the vaccination.

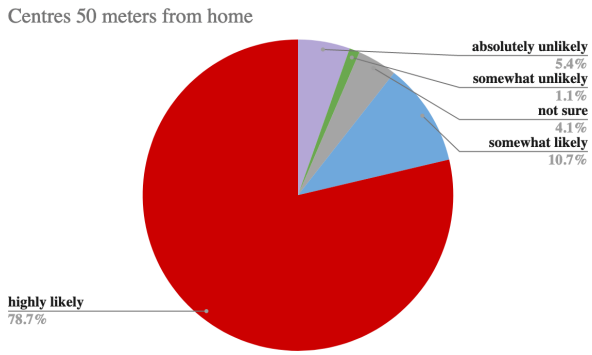

Figure 6

Marital status: The marital status of women had no major influence on their responses to this question.

Educational background: It was found that respondents who had attained educational qualification up to 12th standard (93.17%), graduation and above (91.11%) were more likely to get vaccinated if a vaccination centre opened within 50 metres of their home as compared to respondents who had no formal education (87.42%) or those who had completed their schooling up to the 5th standard (90.1%) and 10th standard (88.79%).

Respondent Educational Levels	No formal schooling	Up to 5th standard	Up to 10th standard	Up to 12th standard	Undergrad and above
Unlikely	7.86	3.96	6.32	4.97	7.78
Not Sure	4.72	5.94	4.89	1.86	1.11
Likely	87.42	90.1	88.79	93.17	91.11

Religion: 8.9% respondents from Muslim households reported that they were unlikely to get vaccinated even if a vaccination centre was opened at a distance of 50 metres from their home, in comparison to 5.78% from Hindu households.

Religion	Hindu	Muslim	Other
Unlikely	5.78	**8.9**	9.68
Not Sure	3.77	5.76	3.23
Likely	90.45	**85.34**	87.1

Caste: Respondents belonging to ST households displayed the highest likelihood of getting vaccinated based on proximity of a vaccination centre near their home. It was found that 96.43% respondents from ST households were likely to get vaccinated if a vaccine centre opened within 50 metres distance of their house as compared to 89.32% respondents from the General category; 87.34% from OBC; and 89.92% respondents from SC households.

Caste	General	OBC	SC	ST
Unlikely	**5.98**	**8.73**	**6.05**	**1.79**
Not Sure	4.7	3.93	4.03	1.79
Likely	89.32	**87.34**	89.92	**96.43**

Age: The mean age of respondents who expressed the likelihood of getting vaccinated based on the distance between their home and a vaccination centre was 30.4 years which was marginally higher than women who were unlikely/ unsure of getting vaccinated.

4.1.4. Affordability

While the respondents were not asked any direct questions concerning the affordability of vaccines, those who were unvaccinated at the time of the survey were asked whether they preferred private or government centres for receiving the vaccine. To this, 95.58% respondents reported that they preferred a government centre. It may be inferred that this preference for a government centre was indicated on account of free availability of vaccines in such centres as compared to private centres which charged approximately Rs. 700 to Rs. 1200 per dose. [87]

4.2. *Complacency*

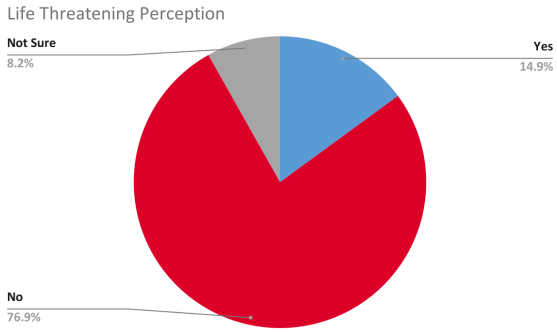

Figure 7

4.2.1. COVID-19 as a life-threatening disease

85.07% of the sample responded that they did not perceive COVID-19 to be a life-threatening disease whereas 14.93% indicated that they perceived it as life threatening.

Religion: 85.93% Hindu households reported that they did not find COVID-19 to be a life-threatening disease as compared to 83.77% Muslim households.

Caste: More SC and ST households, as compared to OBC or General category, reported that they did not consider COVID-19 to be a life-threatening disease or were unsure of whether it was life threatening.

[87] ET Bureau, 'Covishield, Covaxin price cut to Rs. 225 per dose for private hospitals', *Economic Times* (April 2022) available at: https://economictimes.indiatimes.com/news/india/covishield-price-cut-from-rs-600-to-rs-225-per-dose-for-private-hospitals/articleshow/90745023.cms accessed on 16 August, 2022.

Caste	General	OBC	SC	ST
No	77.14	74.24	79.44	**82.14**
Not/ Sure	7.26	8.73	8.47	7.14

4.2.2. Mandatory Uptake of Vaccination

The respondents were asked whether they would take the COVID-19 vaccination only if it was made mandatory by the government or their employer. This question was asked on a five-point Likert scale from "Completely agree" to "Completely disagree" however, it has been reduced to a three-point Likert scale for the purpose of analysis.

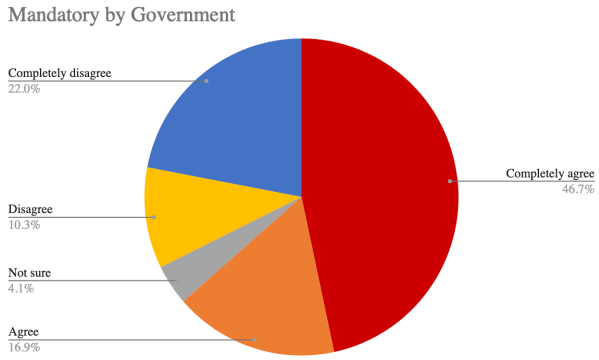

Figure 8

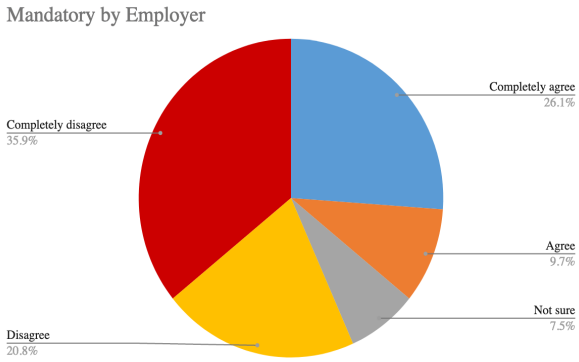

Figure 9

63.56% of the respondents indicated that they would take the vaccine only if it was made mandatory by the government whereas 32.21% disagreed with the statement and 4.13% indicated that they were unsure.

On the other hand, 35.58% respondents reported that they would take the vaccine only if it was made mandatory by their employer whereas 56.68% disagreed with the statement and 7.47% indicated that they were unsure.

These responses indicate that a mandate by the government is more likely to influence uptake of the vaccination as compared to the uptake being made compulsory by an employer.

4.3. *Confidence*

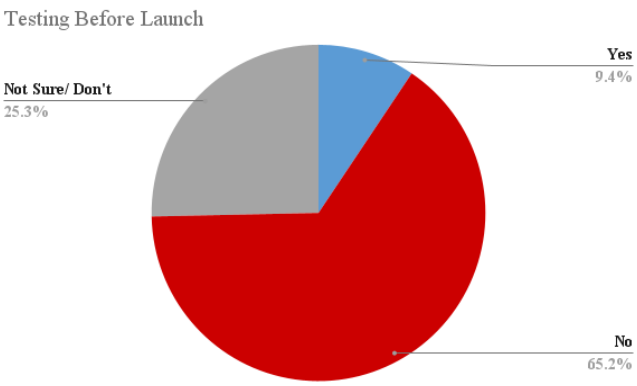

Figure 10

4.3.1. Trials before vaccine launch

To the question concerning adequate scientific testing prior to the rollout, 65.23% respondents stated that the vaccine had not been adequately tested whereas 25.34% stated that they were unsure. 9.43% respondents from the sample believed that the vaccine had been properly tested.

Educational background: The educational qualification of the respondents had a significant impact on their response to this question wherein higher number of less educated respondents i.e., with schooling up to 10th standard stated that they were unsure of whether the vaccines were properly tested before administration. Interestingly, higher number of respondents with less educated spouses also noted that they were "not sure" about whether the vaccine had been adequately tested.

Respondent Educational Levels	No formal schooling	Up to 5th standard	Up to 10th standard	Up to 12th standard	Undergrad and above
Yes	12.89	12.87	8.62	3.73	6.67
No	51.89	52.48	67.82	**81.99**	**86.67**
Not Sure/ Don't Know	35.22	34.65	23.56	14.29	6.67

On the other hand, significantly better-educated respondents stated that the vaccines had not been properly tested. 81.99% respondents who had completed their schooling up to the 12th standard and 86.67% respondents who were graduates and above noted that the vaccines had not been properly tested.

Religion: More Muslim respondents indicated that they were not sure of whether the vaccines had been adequately tested (32.98%) as compared to other religions.

Caste	General	OBC	SC	ST	***Religion***	Hindu	Muslim	Other
Yes	13.54	6.85	6.85	12.5	Yes	7.91	16.75	3.23
No	55.9	70.16	70.16	64.29	No	68.59	50.26	70.97
Not Sure/ Don't Know	30.57	22.98	22.98	23.21	Not Sure/ Don't Know	23.49	32.98	25.81

Caste: More respondents from the General category (30.57%) noted that they were unsure of the adequacy of clinical trials of the vaccine.

4.3.2. Side effects and associated risks

On a three-point Likert scale, 65.62% respondents stated that they were concerned about the risk in terms of side effects and serious adverse events from the currently available COVID-19 vaccines. 28.69% of the sample was unconcerned with the side effects whereas 5.7% were unsure.

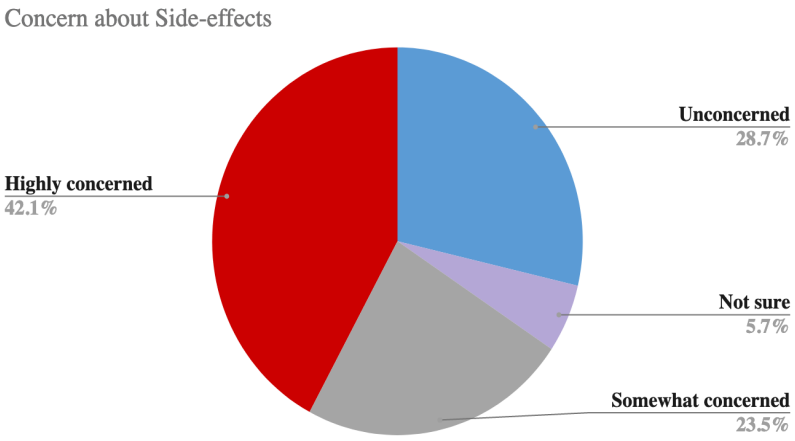

Figure 11

Educational background: Higher number of households with no formal education reported not being sure of the risks associated with the vaccine (9.12%) as compared to respondents who had some formal education. Further, higher number of households with no formal education or education up to the 5th standard were "highly concerned" about the risks associated with the vaccine as compared to

other households with higher education levels. On the matrix of spousal education, it was found that higher number of less educated households, with education up to the 10th standard or below, reported being more concerned about the vaccination as compared to their better educated counterparts.

Respondent Educational Levels	No formal schooling	Up to 5th standard	Up to 10th standard	Up to 12th standard	Undergrad and above
Not concerned	27.99	28.71	30.17	27.33	27.78
Not sure	9.12	2.97	4.31	4.35	4.44
Somewhat concerned	20.44	23.76	23.56	26.09	28.89
Highly concerned	42.45	44.55	41.95	42.24	38.89

Religion: 49.21% Muslim households reported being "highly concerned" about the risks and side effects associated with the vaccine which was marginally higher as compared to respondents from other religions.

Caste: 53.57% respondents belonging to the ST category were "highly concerned" about the risks and side effects associated with the vaccine as compared to other caste categories. On the other hand, 30.34% respondents from the General category indicated that they were not concerned with the post vaccination risks or effects.

Caste	General	OBC	SC	ST	***Religion***	Hindu	Muslim	Other
Not concerned	30.34	27.95	28.63	17.86	Not concerned	30.28	20.42	38.71
Not sure	5.13	6.11	7.26	1.79	Not sure	5.65	6.81	0
Somewhat concerned	22.86	25.33	21.37	26.79	Somewhat concerned	23.62	23.56	19.35
Highly concerned	41.67	40.61	42.74	53.57	Highly concerned	40.45	49.21	41.94

Financial independence: 47.7% financially independent women women reported being "highly concerned" which was marginally higher when compared to the full sample.

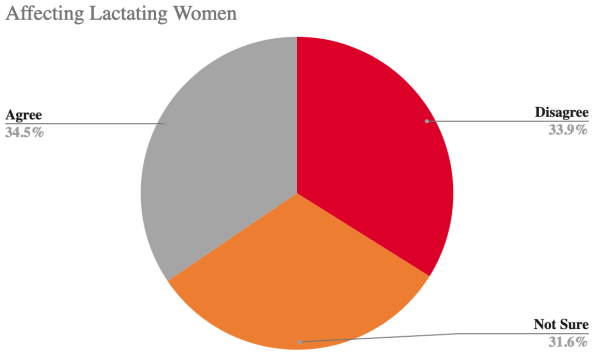

Figure 12

4.3.3. Impact on pregnant and lactating women

On the question of whether the vaccine could be harmful for pregnant and lactating women, 34.48% of the respondents agreed whereas 33.89% respondents disagreed and 31.63% remained unsure. It is therefore not clear whether the impact which the vaccine may have on pregnant and lactating women has been made sufficiently clear or understood.

Educational background: It was observed that better educated households disagreed with the fact that the vaccine was harmful for pregnant or lactating women whereas more respondents from lesser educated households concurred with this statement.

Religion: 35.93% Hindu households disagreed with the statement as compared to their Muslim (27.23%) and other (22.58%) counterparts. On the other hand, 37.17% Muslim households felt that the vaccine could have adverse effects for pregnant or lactating women.

Caste	General	OBC	SC	ST	***Religion***	Hindu	Muslim	Other
Disagree	35.26	**32.31**	32.26	33.93	Disagree	35.93	27.23	22.58
Not Sure	33.12	30.57	30.65	30.36	Not Sure	30.03	35.6	48.39
Agree	31.62	37.12	37.1	35.71	Agree	34.05	37.17	29.03

Caste: 35.26% respondents belonging to the General category disagreed with the statement that the vaccine may have an adverse effect on pregnant and lactating women, which was marginally higher as compared to respondents belonging to other caste categories. On the other hand, more respondents belonging to OBC and SC households indicated that the vaccine could have negative effects on the health of pregnant and lactating women.

4.4. *Information*

4.4.1. Sources of information

Respondents were asked what their main source of information regarding the COVID-19 vaccine was and multiple choices were given to them. It was found that neighbours or other community members were the most popular source of information (22%), followed by newspapers (17%), social media (14%), others (14%), internet (12%), family members (12%), official circulars (6%), friends (2%), and teachers (1%). Interestingly, communication from the respondent's social circle of people viz. neighbours or other community members, family members, friends, and teachers was found to be the main source of information at 37%. Whereas non-personal sources such as newspapers, social media, internet, and official circulars were found to be the main sources of information for 49% of the respondents.

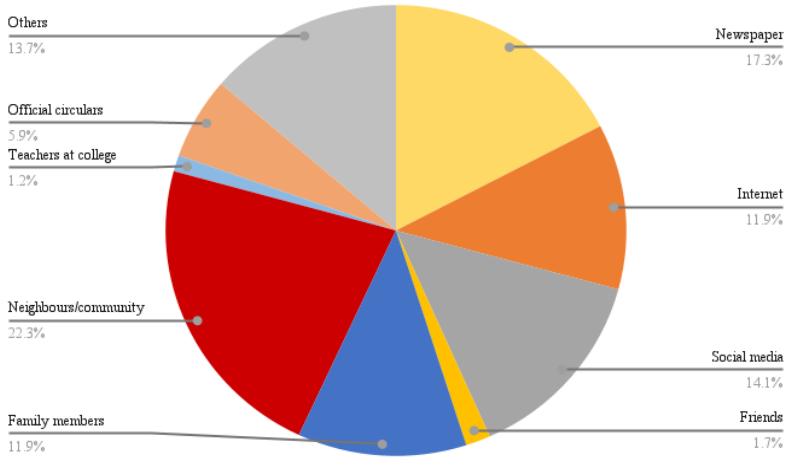

Figure 13

4.4.2. Information from government or public health experts

The respondents were also asked how trustworthy they perceived information concerning the COVID-19 vaccines from government or public health experts. To this, 89.59% respondents indicated that they trust such information whereas only 4.42% indicated that such information was untrustworthy.

4.5. General Perceptions

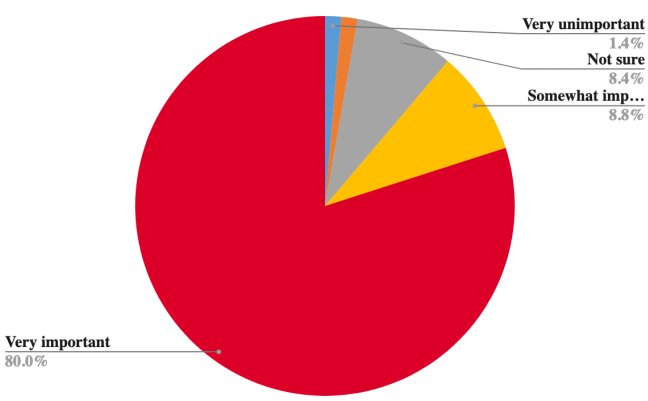

Figure 14

To gauge their overall perception concerning COVID-19 vaccines, respondents were asked whether the vaccine was important for women to stay healthy. 88.8% of the sample agreed that the vaccination was important for them to stay healthy whereas 2.76% indicated that it was unimportant and 8.45% respondents stated that they were not sure. The respondents were also asked whether vaccines should be made mandatory as a prerequisite to travelling. To this question, an overwhelming 92.93% respondents stated that the vaccination should be made mandatory for both inter-state and international travel.

On a separate but related question concerning the importance of vaccinations to attend educational institutions, about 97% of the respondents reported that vaccines should be made mandatory for attending such institutions. The responses to these questions underscore the faith of the respondents in the role of the vaccine to control and minimise the spread of COVID-19.

4.6. Effectiveness of vaccination

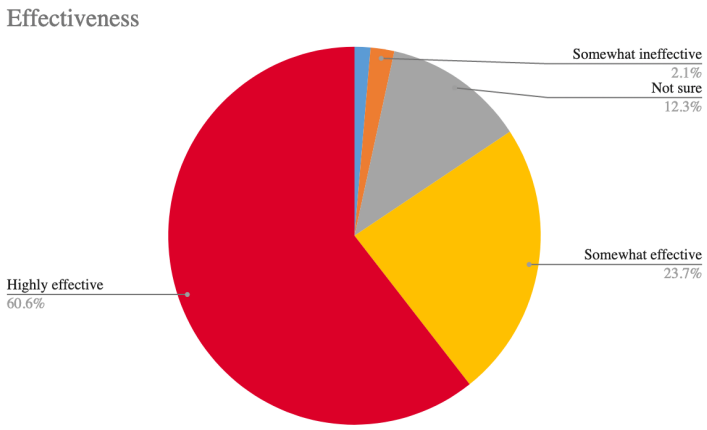

Figure 15

The respondents were asked how effective they perceived the COVID-19 vaccine to be in terms of protecting them from the disease. To this, 87.72% women stated that they found the vaccination to be effective whereas only 2.66% indicated that they found the vaccine to be ineffective and 9.63% were unsure. The respondents were also asked how effective the vaccine was to reduce the spread of disease in the community. 84.28% felt that the vaccine was instrumental in reducing the spread of disease in the community whereas 3.44% women indicated that it was ineffective. This similarly indicates a positive response to the vaccine wherein an overwhelming majority of the respondents found a positive correlation between being vaccinated and being healthy.

4.7. Influence

The respondents were also asked whether they would be willing to motivate other women to take the COVID-19 vaccine. The response was largely positive wherein 90.77% of the sample answered in the affirmative and only 9.23% expressed scepticism.

5. Conclusion and Recommendations

Before delving into the recommendations of this report, it is important to address the bigger question of 'who' will be responsible to bring forth these necessary changes.

In circumstances of public health emergencies, the State government and Central government are statutorily obligated to take necessary measures. However, a lack of clear division of roles and responsibilities persists in the statutory and constitutional framework. The Constitution of India under Article 47 gives the State the responsibility to protect the public health of citizens by way of Directive Principles.[88] Further, the Epidemic Diseases Act, 1897 and the Disaster Management Act, 2005 together give broad powers to the Central Government to take necessary steps to control an epidemic, which includes measures towards inoculation.[89] The existing legal framework and the powers granted to both the Centre and the State do not appear to have a comprehensive and clear mechanism to tackle public health emergencies. The lack of clarity of roles and responsibilities also has the possibility of interfering with responsive and efficient government action in the face of a sweeping public health emergency as seen with the COVID-19 pandemic.[90]

In light of this, there may be a need to develop a collaborative legal framework between the Centre and the State, spanning over multiple subject-matters to allow the government as a whole to effectively respond to various aspects of a public health emergency. A legal framework which authoritatively delegates responsibilities between the various organs and levels of state machinery, prescribing the rights and duties of various stakeholders may need to be put in place to facilitate an effective government response.[91] However, the answer to this question does not fall within the purview of this study.

While acquiescing to the lack of clarity regarding who is responsible for implementing the change, this section of the report lists recommendations based on the findings of the study with the aim of achieving specific consequences and results. Recommendations have been listed under two categories i.e., *Systemic Recommendations* and *Granular Recommendations*. Within each category, recommendations have been supplemented with a tentative indication as to which government entity may be best placed to implement the recommendations.

5.1. Systemic Recommendations

The systemic recommendations are those that are to be implemented at a sectoral level. The sectoral measures are those that will have the immediate effect of regulating the entire health sector. Based on the literature review conducted under this study, the following broad-based recommendations may help reduce vaccine hesitancy among women:

(a) There is a lack of scientific research regarding the effects of the vaccination on the health of women inter alia the information on trial data or risks associated with the vaccine was missing or not made available to the population of the country in a timely and uniform manner. To tackle these issues, renewed efforts must be taken to encourage scientific

[88] Article 47, The Constitution of India, 1950.
[89] Section 2, Epidemic Diseases Act, 1897; Section 10(2)(1) of the Disaster Management Act 2005; See also: Ministry of Home Affairs, 'National Directive for Effective Control of Covid-19' (2021) available at: https://www.mha.gov.in/sites/default/files/MHAOrder_23032021_0.pdf accessed on 13 October, 2022.
[90] Kevin James, 'Covid-19 and the Need for Clear Centre-State Roles', *Vidhi*, (2020), available at: https://vidhilegalpolicy.in/blog/covid-19-and-the-need-for-clear-centre-state-roles/, accessed on 22 September, 2022.
[91] Kim D'Souza, 'Drafting a Public Health Emergency Preparedness and Response Law' (2020) Vidhi Centre for Legal Policy, available at: https://vidhilegalpolicy.in/blog/a-public-health-emergency-preparedness-and-response-law/ accessed on 13 October, 2022.

research on issues regarding the health of women in response to contemporary issues affecting such health.[92]

(b) Although the power to legislate on matters relating to 'public health' fall under the State List as per the Constitution, actions to mitigate public health emergencies also find authorisation in the Union List.[93] The Centre has higher financial capacity and resources to address such issues, for example, the Ministry of Health and Family Welfare is assisted by the National Centre for Disease Control, National Health System Resources Centre and the Indian Council for Medical Research on matters of public health emergencies.[94] On the other hand the States may have more capacity to carry out the actual implementation of public health programmes like inoculation and other health measures due to easier reach at the grass-root level. Owing to this, better coordination between the Central and State Government must be developed to construct a standard of care framework for epidemiological surveillance in terms of collection and analysis of subjective data on perception of women towards health care.[95]

(c) At the tail-end of the inoculation protocol for COVID-19, there was no recognition of gendered measures to encourage inoculation amongst women. Construction of comprehensive inoculation policy documents with the capacity to address and absorb the dynamic changes that occur during the life cycle of a health emergency and also prescribe focused programmes to address the unique issues of different groups of people.[96]

5.2. Granular recommendations

The granular recommendations are those may not have the immediate effect of regulating the entire sector. Instead, they may only affect a specific area of a sector. The following granular recommendations have been identified on the basis of the 3Cs analysed in Chapter 4:

5.2.1. Convenience:

(a) *Utilising Intra-Community Connections:* In our findings, it was seen that women from marginal caste and religious backgrounds found reaching the vaccination centre as well as the process of getting vaccines difficult as compared to the overall survey sample. This gap could perhaps be addressed by building interpersonal social networks within marginalised communities which would facilitate the delivery of verified information for any relevant issue concerning vaccination. To deliver the verified information, interpersonal social networks are likely to take time to establish themselves and build the trust needed among

[92] Chloe.E Bird, 'Underfunding of Research in Women's Health Issues Is the Biggest Missed Opportunity in Health Care' (2022), available at: https://www.rand.org/blog/2022/02/underfunding-of-research-in-womens-health-issues-is.html accessed on 22 September, 2022. See also: The Guardian 'Women have been woefully neglected': does medical science have a gender problem?' (2019), available at: https://www.theguardian.com/education/2019/dec/18/women-have-been-woefully-neglected-does-medical-science-have-a-gender-problem accessed on 22 September, 2022.

[93] Kevin James, 'Covid-19 and the Need for Clear Centre-State Roles', *Vidhi*, (2020), available at: https://vidhilegalpolicy.in/blog/covid-19-and-the-need-for-clear-centre-state-roles/, accessed on 22 September, 2022.

[94] Shashank Atreya, 'Health a state subject, but Covid proved how dependant India's states are on Centre', *The Print*, (June 2020), available at: https://theprint.in/opinion/health-a-state-subject-but-covid-proved-how-dependant-indias-states-are-on-centre/442602/, accessed on 22 September, 2022.

[95] Kevin James, 'Covid-19 and the Need for Clear Centre-State Roles', *Vidhi*, (2020), available at: https://vidhilegalpolicy.in/blog/covid-19-and-the-need-for-clear-centre-state-roles/, accessed on 22 September, 2022.

[96] World Health Organisation, 'Immunisation Agenda 2030: A global strategy to leave no one behind' (2021), available at: https://www.who.int/docs/default-source/immunization/strategy/ia2030/ia2030-document-en.pdf accessed on 22 September, 2022. See also: Ministry of Health and Family Affairs, 'National Vaccine Policy' (2011), available at: https://main.mohfw.gov.in/sites/default/files/108481119000.pdf accessed on 22 September, 2022 and 'Revised Guidelines for implementation of National COVID Vaccination Program', (2021), available at: https://www.mohfw.gov.in/pdf/RevisedVaccinationGuidelines.pdf accessed on 22 September, 2022.

the members of the community in order to effectively deliver information or help regarding vaccination.[97] The following steps could help build necessary intra-community connections:

- Identifying already organised local groups (such as church groups, women's local groups, marwari groups) or creating new local groups to maintain an active centre for women to ask or receive information regarding critical issues.
- Training these groups to cater to specific issues such as vaccination and knowledge dissemination.
- Conducting workshops to train the members of the group to draft information brochures in local languages.
- Organising vaccination camps by utilising the space held by organised groups.
- Encouraging these groups to provide the information regarding issues faced by the population that approaches them to the local governments to further refine the mechanisms of disseminating information to marginalised women's groups.

Implementation: This recommendation may be best implemented by the municipal-level government by delegating specific tasks to relevant officers and representatives. The activity of facilitating intra-community social networks will require colony-level activities.

(b) *Multifaceted delivery system:* In our findings it was seen that married women, women who are educated below 5th standard and women above a certain age found it difficult to access vaccinations. This gap could be addressed by making granular change for small groups of people based on their individual needs. This may be implemented through the following recommendations:

- Special kiosks could be constructed at vaccination centres for digitally illiterate and older women to help them get registered for the process.
- Shuttle transport service may be introduced to help older women reach vaccination centres.
- Mobile vaccination stations could be deployed for some localities with higher concentration of such population.
- The timing of the vaccination may be tailored to suit small groups of people, for example the working class or the agriculture workers who work through the day may not be able to access vaccine centres during the weekdays.

Implementation: The State Government may be best placed to implement the recommendation because the State Government is more likely to promulgate policies by paying consideration to the local conditions, which includes local culture, weather and climatic conditions, economy, and demographics.

5.2.2. Complacency

(a) *Stable and continued dissemination of information:* In our findings it was seen that a large percentage of women did not perceive COVID-19 as a life-threatening disease. To effectively tackle this issue, information dissemination models from the past may be utilised to spread awareness regarding the severity of the disease and especially the consequences of not taking a vaccine against it. This can be executed through the following ways:

- Releasing well-researched information packets about the disease in regional languages.
- Continually releasing informational material based on the evolving virus, its variants and side effects.

[97] Jae M. Sevelius et. al, 'Research with Marginalised Communities: Challenges to Continuity During the COVID-19 Pandemic', (2020), available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7228861/ accessed on 22 September, 2022.

Implementation: Stable and continued dissemination of information can best be implemented by uniform strategy devised by the Central Government. The implementation of the policy, however, will best be done by State Governments. The information could be disseminated in the local languages and dialects. The State-level governments are likely to be more aware about the languages and dialects spoken in a particular area of a state.

(b) *Accessibility of information:* The digital literacy rate of women in India indicates that dissemination of information regarding the vaccination may not have reached the maximum population of women as they do not have access to devices or the awareness to access government or private websites for information regarding the disease and its preventive measures. This further reduced their ability to access the CoWin portal for registrations to get the vaccines. To address this gap, informal networks may be utilised to disseminate information such as involvement and training of village panchayats, community leaders, local women's group leaders to utilise their trusted position in the society and successfully relay the severity of the disease and necessity of vaccination. Involving local governments and their allied groups such as civil society organisations, local community leaders and women's grounds to disseminate information in their areas.

Implementation: The municipal-level government may be best placed to implement the recommendation because building informal networks requires micro-level administration, i.e., administration at the level of residential colonies where the government will facilitate building of a network through its officers.

5.2.3. Confidence

(a) *After-care processes:* In our findings it was seen that there was a general concern regarding the side-effects of the vaccines. This was more so in cases of prenatal and postnatal women. To address this gap, the vaccination centres should be geared towards not only delivering the vaccination but also functioning as a centre for information regarding side-effects, health risks and as a make-shift outpatient desk to treat side-effects suffered by the women after being vaccinated.

- General information kiosks for disseminating information regarding the nature of the disease, key points of trial data and other relevant information to build a relationship of trust and transparency with the public and especially women.
- Kiosks dedicated to addressing the questions regarding side-effects from the vaccines
- Special desks at local hospitals and clinics to cater to the side-effects experienced by women.

Implementation: This would be best implemented by the Central Government because the implementation of the recommendation will require sector-level change of having the hospital and clinics across the nation.

(b) *Recruitments and training of female health care workers:* In our findings it was seen that women were eager to encourage other women to take the vaccine. To capitalise this finding, training, and situating female health care workers at the vaccination centres with appropriate information regarding precautions and consequences of the vaccination for women could inspire confidence.

- Educating frontline rural healthcare workers under organisations such as Accredited Social Health Activist (ASHA) Workers, Anganwadi workers and other self-help groups (SHGs) to disseminate information.
- Training workers from organisations such as ASHA Workers, Anganwadi workers and other self-help groups to deliver the vaccination to female receivers.

Implementation: The recommendation will be best implemented by the Central Government because schemes surrounding ASHA, Anganwadi workers and SHGs are likely to be Centrally sponsored.[98]

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[98] Ministry of Women and Child Welfare, Government of India , 'Angandwadi System' (2019), available at : https://pib.gov.in/Pressreleaseshare.aspx?PRID=1579511#:~:text=Anganwadi%20Services%20Scheme%20is%20a,issued%20by%20Government%20of%20India accessed on 26 October, 2022.