COVID-19 Vaccine Hesitancy during First Phase of Vaccination Drive in Kerala, India: A Cross - Sectional Study

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Abstract

Background

The Coronavirus Disease 2019 (COVID-19) has impacted over 200 nations, wreaking havoc on global health and economies since its emergence. Despite the fact that vaccinations are the most effective and basic treatment instruments for reliably avoiding COVID-19 pandemic, vaccine hesitancy has become a significant public health concern that has made successful immunization difficult. The aim of this study was to identify the barriers causing COVID-19 vaccine hesitancy among the residents of Southern Kerala during first phase of vaccination drive.

Materials and Methods

We conducted an online cross-sectional survey among 525 participants from southern districts of Kerala during the first phase of vaccination drive. The data was entered in Microsoft excel-2010 version and results were presented in tabular and graphical form as frequency and percentage.

Results

Of the total, 16% demonstrated their unwillingness for uptake of COVID-19 vaccine. The concerns regarding the vaccine side effects acted a key barrier for vaccine uptake in 36% of participants. 30% were concerned about safety and efficacy of vaccine. This study also analyzed the myths and misconceptions related to COVID-19 vaccine hindering its acceptance.

Conclusion

The factors that influenced COVID-19 vaccination acceptance and hesitancy differed globally. This study found that the concerns regarding the vaccine side effects acted as a key barrier to vaccine acceptance among the population of Kerala. The findings of this study could help the government, public health agencies, and awareness organizations to tackle vaccine hesitancy and to enhance acceptance of the COVID-19 Vaccine.

Keywords

COVID-19, vaccine acceptance, vaccine hesitancy, barrier, vaccination drive, Kerala

Introduction

Coronavirus disease 2019 (COVID-19) is currently a health emergency across the globe. It is caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) [1]. The novel SARS-CoV-2 outbreak occurred in Wuhan Hubei province, China in December 2019 [2]. The WHO declared COVID-19 as a global pandemic on March 11, 2020 [3,4]. Since its onset, the pandemic has had a devastating impact on global health and economies [1,2]. Various control measures have been implemented in countries throughout the world to limit the spread of SARS-CoV-2 infection and mitigate its health effects. Government of most of the nations have implemented non- pharmaceutical interventions (NPI's) to halt the disease such as social distancing, wearing face masks in the public, disinfection of surfaces, frequent handwashing, hand sanitization, partial or complete lockdown, travel restrictions, closing schools and businesses [5]. Despite the fact that such NPI's have helped to slow down the spread, COVID-19 has resurfaced as societies and economies have reopened [2,3]. As a result, a long-term preventive measure is required. The development of SARS-CoV-2 vaccination is the only way to stop the pandemic. To put an end to this pandemic, massive efforts have been conducted around the world to produce a variety of vaccines [2]. COVID-19 vaccination has the potential to produce herd immunity in populations, lowering disease incidence, preventing transmission and lessen the disease's social and economic toll [4].

The currently proposed vaccination program against COVID-19 seems promising in providing protection against the virus [6]. However, there is widespread hesitancy about COVID-19 immunization. World Health Organization (WHO) declared vaccine hesitancy among the top 10 health threats in 2019 [7]. Based on the Strategic Advisory Group of Experts on Immunization (SAGE), vaccine hesitancy is the term used to describe: "delay in acceptance or refusal of vaccination despite availability of vaccination services" [8]. A systematic review of studies examining the confidence and receptivity for COVID-19 vaccines noted several important findings related to lower

acceptance of vaccine including: fear of side effects, safety, effectiveness, belief that it is unnecessary, inadequate information, unknown duration of immunity, and general anti-vaccination belief [9]. The vaccine hesitancy could lead to refusal or delay of vaccination, may eventually cause a reduction in coverage rate of the vaccine and affect its effectiveness. The Vaccine hesitancy poses threats to the success of the COVID-19 vaccination drive.

Despite massive immunization programs adopted in India to promote the uptake of vaccine among the population, certain misconceptions and myths related to COVID-19 are also spreading through the social media. Misconceptions and misinformation can act as major roadblocks in attaining vaccine acceptance among the population [10,11,12,13]. People's self-reported willingness to get vaccinated against COVID-19 has been proven to be negatively affected by this misinformation [14,15].

To successfully deploy a safe and effective vaccination, it is vital to identify barriers causing hesitancy to vaccine uptake. The vaccine acceptance can be enhanced by addressing these barriers. This study aims to assess the barriers associated with acceptance of COVID-19 vaccine.

Materials and Methods

Study Design and Setting

We conducted an online Cross – sectional survey about vaccine hesitancy among the residents of southern districts of Kerala during first phase of vaccination drive. The duration of study was six months (January 2021- June 2021).

Sample Size

The sample size was calculated with based on a 95% confidence level. The sample size has been calculated with the following formula.

⚙ **Formula:**

$$n = Z^2_{1-\alpha/2}\, \sigma^2/d^2, \text{ where,}$$

n = sample size
$Z^2_{1-\alpha/2}$ = confidence interval
σ = estimated standard deviation
d = desired precision

Study Criteria

NCLUSION CRITERIA: People > 18 years of age

EXCLUSION CRITERIA: People< 18 years of age.

➢ Pregnant and lactating women

Study Questionnaire

The questionnaire used in this study was self developed following a review of literature [1]. The questionnaire was structured into 2 sections covering demographic data, willingness for vaccine uptake, barriers for vaccine uptake and myths and misconceptions hindering vaccine uptake. The questionnaire was developed in the English language.

Data collection procedure

Participants were asked to fill a prepared Google form. Participants who showed unwillingness to take COVID-19 vaccine were asked about the reasons for vaccine hesitancy. The data on vaccine hesitancy was identified using a single question having multiple responses.

Data analysis

The data was entered in Microsoft excel-2010 version and results were presented in tabular and graphical form as frequency and percentage.

Ethical considerations

The study was approved by the Institutional Review Board of Nazareth College of Pharmacy, Othera Thiruvalla. Steps were taken to ensure confidentiality and privacy of the information provided by the participants.

Results

Table 1: Distribution of age group

S. No.	Age Group	Frequency	Percentage
1	18-38	128	24.4
2	38-58	135	25.7
3	58-78	136	25.9
4	78-98	126	24
	Total	525	100

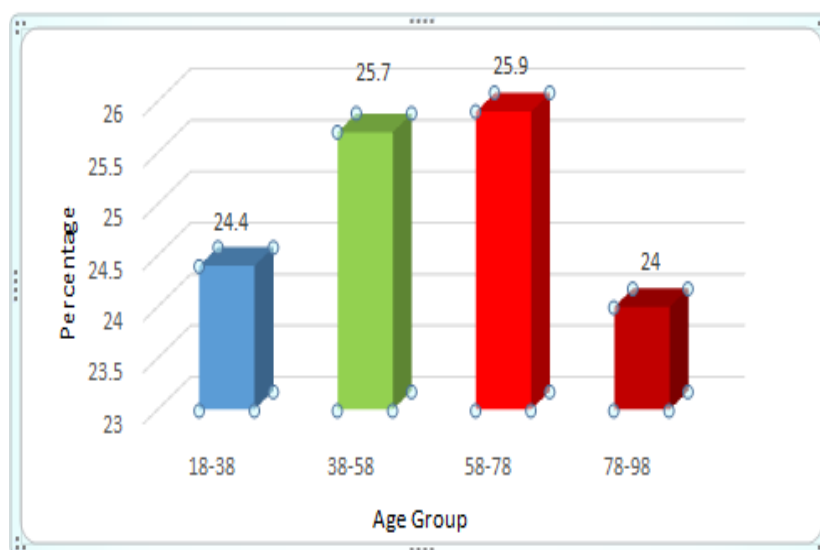**Figure 1:** Distribution of age group

Figure 2: Distribution of age group

From the above Fig 1, age category 18-38 comprises 24.4% of total responders while 25.7% of responders belong to age category 38-58.Another 25.9% of responders belong to age group 58-78 and the rest 24 % belong to 78-98.

Table 2: Distribution of gender

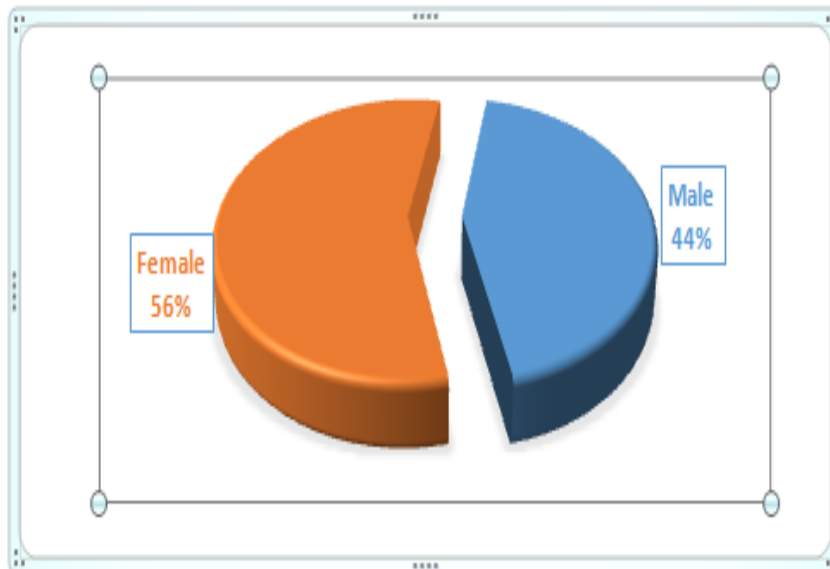| S. No.	Gender	Frequency	Percentage
1	Male	229	44
2	Female	296	56
	Total	525	100

Figure 3: Distribution of gender


Figure 2: Distribution of gender

The Fig.2: reveals that out of 525 subjects, 229 which comprises of 44% of total responders are males and 296 (56%) responders are females.

Reasons for Vaccine Hesitancy

Table 3: Distribution of various barriers in taking COVID-19 vaccine

S. No.	Barriers	Frequency	Percentage
1	Side effects	250	36
2	Concerns about safety and efficacy	203	30
3	Scared about getting vaccinated	82	12
4	Vaccine developed through fast clinical trials	76	11
5	Personally opposed to vaccine	8	1
6	Cost	46	7
7	Unforeseen complication	22	3
	Total	687	100

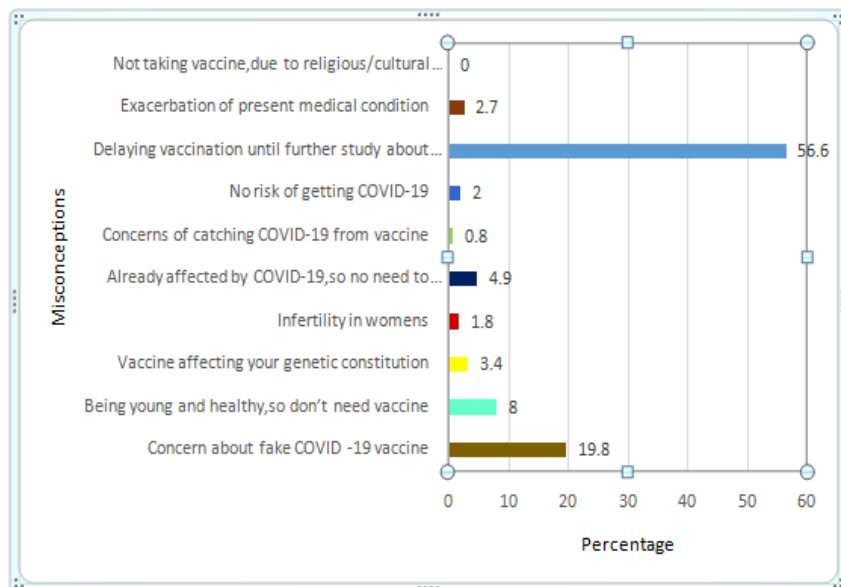**Figure 3:** Distribution of various barriers in taking COVID-19 vaccine
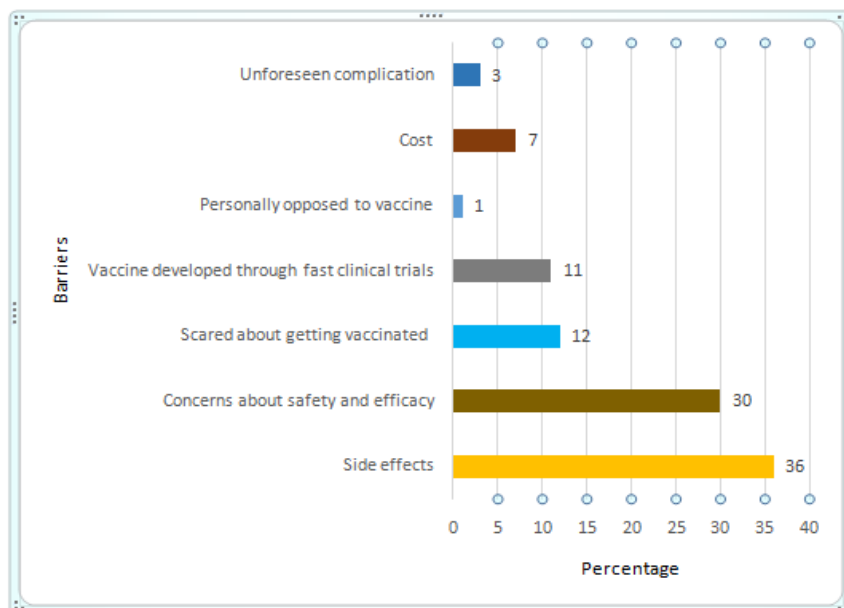
The barriers associated with acceptance of COVID-19 vaccination were studied using a single question having multiple responses. Among the study population, 36% were concerned about the COVID-19 vaccine side effects and 30% were concerned about the safety and efficacy of the vaccine. However, 12% of respondents were scared of getting vaccinated while 11% of respondents were concerned about vaccine developed through fast clinical trials and 1% were personally opposed to vaccine whereas 7% of individuals were concerned about the cost and 3% were concerned about unforeseen complication.

Table 4: Distribution of misconceptions hindering COVID-19 vaccine acceptance

S. No.	Response	Frequency	Percentage
1	Concern about fake COVID -19 vaccine	167	19.8
2	Being young and healthy, so don't need vaccine	68	8
3	Vaccine affecting your genetic constitution	29	3.4
4	Infertility in women	15	1.8
5	Already affected by COVID-19,so no need to take vaccine	41	4.9
6	Concerns of catching COVID-19 from vaccine	7	0.8
7	No risk of getting COVID-19	17	2
8	You can delay vaccination until further study about safety and adverse effects are published	478	56.6
9	Exacerbation of present medical condition	23	2.7
10	Not taking vaccine, due to religious/cultural beliefs.	0	0
	Total	845	100

Figure 4: Distribution of misconceptions hindering COVID-19 vaccine acceptance

The misconceptions hindering with acceptance of COVID-19 vaccination were studied using a single question having multiple responses. Among the study population, the majority of the respondents (56.6%) are planning to postpone vaccination until further studies are published, 20% had concern about fake COVID -19 vaccine. 8%, 3.4%, 2% were not willing to take vaccine because of being young and healthy, scared of vaccine affecting their genetic constitution and vaccine causing infertility in women, respectively.4.9% decided not to take vaccine because they were previously affected by COVID-19. 0.8% and 2% were not taking vaccine because they have concerns about getting COVID-19 after vaccination and had no risk for getting COVID-19 respectively. 3% were not willing to take vaccine as they were scared of vaccine induced exacerbation of present medical condition. It was found that cultural/religious belief were not a misconception in taking vaccination.

Discussion

Since the start of 2020, the arena has witnessed a disaster in the form of COVID-19. For over a year, people around the world have been eagerly awaiting the potential of a vaccine to contain a pandemic. An important strategy to prevent further progression and deterioration of the scenario is an efficient vaccination program. Vaccination against COVID-19 has become an important factor as the world counterattacks to combat a serious health crisis. This study aims to assess public resistance to the COVID-19 vaccine. Vaccine apprehension continues to be a substantial impediment to immunization program compliance and success. This study was conducted during the initial phase of vaccination drive from January 2021 to June 2021. The study population consists of 525 participants. The study was a cross-sectional study. The data of the patients were collected using Google form, then the data entered into a predesigned data collection Proforma.

Regarding total vaccine acceptance among study population, the total acceptance of COVID -19 vaccine during the first phase of the vaccination drive was found to be 84%. Among the 525 participants, 86 (16%) were not willing to take the vaccine.

According to a study on "COVID-19 vaccine acceptance and hesitancy in low and middle income countries," the most commonly given reasons for

vaccine hesitancy are misconception about getting disease from the vaccine, not concerned about getting seriously ill, doesn't think vaccines are effective, doesn't think the coronavirus outbreak is as serious as people say, doesn't like needles, allergic to vaccines, and won't have time to get vaccinated [16]. Another study by Khan S et al., titled "Belief and barriers associated with vaccination among general population in India," found that 64.4 percent of the total study population were concerned about vaccine side effects, 20% did not believe in the vaccine's effectiveness in containing the pandemic, 12.5% believe the entire vaccine campaign is a conspiracy, and 12.5% believed the entire vaccine campaign is a hoax. 10.8% feel that vaccination is unnecessary since they take preventative measures carefully. 7.4% believe, they are immune to vaccines because they are young and healthy. 8.3% are terrified of needles and injections, while 42.5 percent have other worries [1]. In another study on addressing barrier to vaccine acceptance: an overview by MacDonaline N E, Butler R and Dude E concluded that vaccine acceptance does not mean hesitancy is not present. Overcoming hesitancy require detection, diagnosis and tailored intervention as there is no simple strategy that can address all the barrier to vaccine acceptance [17]. A study was conducted by Machingaidze S and Wiysonge CS to better understand COVID-19 vaccination uptake and hesitation. They discovered that the reasons for COVID-19 vaccination uptake and hesitation are still unclear. The emergence of new variants, lack of openness in government reports, and flaws in ADR reporting are just a few of the facts that are raising people's worries regarding vaccines [18]. According to our study results, the barriers associated with acceptance of COVID-19 vaccination were studied using a single question having multiple responses.

Among the study population, 36% were concerned about the COVID-19 vaccine side effects and 30% were concerned about the safety and efficacy of the vaccine. However, 12% of respondents were scared of getting vaccinated while 11% of respondents were concerned about vaccine developed through fast clinical trials and 1% was personally opposed to vaccine whereas 7% of individuals were concerned about the cost and 3% were concerned about future adverse effects.

Regarding various misconceptions causing refusal for COVID-19 vaccination, it was found that several studies and literatures have analyzed the myths and misconceptions related to COVID-19 vaccine. Among the study population, the majority of the respondents (56.6%) are planning to postpone vaccination until further studies are published, 20% had concern about fake COVID -19 vaccine. 8%, 3.4%, 2% were not willing to take vaccine because of being young and healthy, scared of vaccine affecting their genetic constitution and vaccine causing infertility in women, respectively. 4.9% decided not to take vaccine because they were previously affected by COVID-19. 0.8% and 2% were not taking vaccine because they have concerns about getting COVID-19 after vaccination and had no risk for getting COVID-19, respectively. 3% were not willing to take vaccine as they were scared of vaccine induced exacerbation of present medical condition. It was found that cultural/religious belief were not a misconception in taking vaccination.

Conclusion

This study found that 16% of the participants in southern Kerala demonstrated their unwillingness to receive the COVID-19 Vaccine. Although an efficient and safe COVID-19 Vaccine is critical for managing and ending the pandemic, it is also critical to ensure that the vaccine is widely accepted. COVID-19 vaccination

hesitancy should be viewed as a serious public health threat by the Government and civil society. Even a low percentage of vaccine hesitancy in India might result in millions of people refusing to get the COVID-19 vaccine across the country, resulting in emerging variants and recurrent outbreaks for a long period. The rapid development of the COVID-19 Vaccine might have contributed to the emergence of concerns among the general population that could affect the public acceptance of the vaccine. This study identified the concerns and misconceptions among the participants regarding the potential acceptance of COVID-19 Vaccine. This study found that the concerns regarding the vaccine side effects acted as a key barrier to vaccine acceptance. It is critical to develop an evidence-based plan to increase public vaccination uptake, which might include informative campaigns addressing vaccine apprehension. Furthermore, while implementing COVID-19 immunization campaigns, techniques establishing the vaccine's efficacy and safety will be critical, and these approaches will undoubtedly have impacts beyond the COVID-19 pandemic. Moreover, we expect that the finding of this study could help the government, public health agencies, and awareness organizations tackle vaccine hesitancy and to enhance acceptance of the COVID-19 Vaccine.

References

1. Sharun K, Rahman CF, Haritha CV, Jose B, Tiwari R, Dhama K. COVID-19 vaccine acceptance: beliefs and barriers associated with vaccination among the general population in India. J Exp Biol Agric Sci. 2020 Jan 1;8 (Spl–1–SARS–CoV–2):S210-8.

2. Elimat ET, AbuAlsameenMM, Almomani BA, Alsawaha NA, Alali FQ. Acceptance and attituted toward COVID-19 vaccines: A cross- sectional study from Jordan. PLoSE ONE. 2021; 16(4): 1-15.

3. Alqudeimat Y, Alenezi D, AlHajri B, Alfouzan H, Almokhaizeem Z, Altamimi S et al. Acceptance of a COVID-19 vaccine and its related determinants among the general adult population in Kuwait. Medical Principles and Practice. 2021; 30(3):262-71.

4. Khuroo MS, Khuroo M, Sofi AA, Khuroo NS. COVID-19 vaccines: A race against time in the middle of death and devastation. Journal of Clinical and Experimental Hepatology. 2020; 10 (6):610-21.

5. Kaur SP, Gupta V. COVID-19 Vaccine: A comprehensive status report. Virus research. 2020 Oct 15; 288:198114.

6. Kumari A, Ranjan P, Chopra S, Kaur D, Kaur T, Upadhyay AD, Isaac JA, Kasiraj R, Prakash B, Kumar P, Dwivedi SN. Knowledge, barriers and facilitators regarding COVID-19 vaccine and vaccination programme among the general population: a cross-sectional survey from one thousand two hundred and forty-nine participants. Diabetes & Metabolic Syndrome: Clinical Research & Reviews. 2021; 15(3):987-92.

7. Al-Qerem WA, Jarab AS. COVID-19 vaccination acceptance and its associated factors among a Middle Eastern population. Frontiers in public health. 2021 Feb 10;9:632914.

8. Rutten FL J, Zhu X, Leppin A, Ridgeway JL, Swift M, Griffin J M. Evidence based strategies for clinical organizations to address COVID-19 vaccine hesitancy. Mayo Clinic Proceedings 2021; doi:https://doi.org/10.1016/J.mayocp.2020.12024

9. Cerda AA, Gaercia LY. Hesitation and refusal factors in individuals' decision making processes regarding a coronavirus disease 2019 vaccination.

Frontiers in public health. 2021. https://doi.org/10.3389/fpubh.2021.626852

10. Mesele M. Awareness and attitude towards COVID-19 vaccination and associated factors in Ethiopia: Cross-sectional study. Infection and Drug Resistance 2021; 14:2193-99.

11. Saleem S. COVID-19 vaccine: Myths and facts. Journal of Rawalpindi Medical College.2020; 25(1):1-2.

12. Suresh A, Konwarth R, Singh A P. Public awareness and acceptance of COVID-19 vaccines: An online croos sectional survey conducted in the first phase of vaccination drive in India. Research Square.2021; Article in press.

13. Al-Metwali BZ, Al-Jumaili AA, Al-Alag ZA, Sorofman B. Exploring the acceptance of COVID-19 vaccine among healthcare workers and general population using health belief model. Journal of evaluation in clinical practice. 2021; 27(5):1112-22.

14. Roozenbeek J, Schneider CR, Dryhurst S, Kerr J, Freeman AL, Recchia G et al. Susceptibility to misinformation about COVID-19 around the world. Royal Society open science. 2020; 7(10):201199.

15. Green MS, Abdullah R, Vered S, Nitzan D. A study of ethnic, gender and educational differences in attitudes toward COVID-19 vaccines in Israel–implications for vaccination implementation policies. Israel Journal of Health Policy Research. 2021; 10(1):1-2.

16. Solís Arce JS, Warren SS, Meriggi NF, Scacco A, McMurry N, Voors M et al. COVID-19 vaccine acceptance and hesitancy in low-and middle-income countries. Nature medicine. 2021 Aug;27(8):1385-94.

17. Dutta AK. Vaccine against Covid-19 disease–present status of development. The Indian Journal of Pediatrics. 2020; 87(10):810-6.

18. Machingaidze S, Wiysonge CS. Understanding COVID-19 vaccine hesitancy. Nature Medicine. 2021; 27(8):1338-9.