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ANALYSIS OF PUBLIC MEDIA CONTENT IN COVID-19: A CASE FROM KERALA

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Abstract

During the Covid-19 pandemic, governments implemented various communication strategies, some of which were effective in controlling the infection rate and mortality. Kerala, state of India, adopted a unique approach by conducting approximately 200 daily press conferences led by the chief executive, which were broadcasted live across mass and social media. This proactive strategy along with specific nutrition and community support activities contributed to the state's relatively better Covid control.This is credited to have resulted in a repeat mandate in the State Assembly Election of April 2021.

This studyanalyses the thematic content of 118 such press conferences (73 hours) and identify the variables controlling the design and content as well as resultant variability. It is seen that the duration and thediverse thematic content of the press conferences were significantly controlled by the rate of spread of the disease. As compared to the first epidemiologically inclined phase, the second electorally proximal phase showed more commitment to themes like covid testing, covid data and an increasing *miscellaneous* category less related to the pandemic.Miscellaneous content largely addressed reward seeking political economy factors.21% of the thematic variance could be explained by the covid-19 spread and the days remaining to the general elections. It could be seen

that the videographic content was largely demand (need for information) and reward/incentive driven, the electoral dividend being the resultant incentive for effective public policy and action for a government during the pandemic phase. Political economy factorsdrove the content design as much as the Covid infection variables as the pandemic phase progressed.

Keywords: Social media,Mass media, Content analysis, Effective reproduction number

1.Introduction

SARS-CoV-2 virus (Covid-19) emerged in Wuhan city, China and spread all over the world within a short span of time (Guan et al., 2020) and wasdeclared as a pandemic on 11 March 2020(Bedford et al., 2020)**.** The whole world adopted various preventive measures to decrease the spread of the pandemic under the leaderships of WHO**.** Dhawan, Bekalu, et al (2021) suggested that two factors that can influence covid-19 preventive behaviours are information and self-efficacy. Among these, the measures taken by public stakeholders and governments to use information communication technology (ICT) and visual mass media to inform the public on health concerns and pandemic control measures were remarkable(Ram & Sornette, 2021). Informational support obtained primarily through private online involvement elicited higher perceived efficacy to cope with thepandemic(Guan et al., 2020).Moreover, customizing health messages helps to debunk misinformationas well asincrease self-efficacy for preventive behaviours.

During the first wave of Covid-19 infections, Kerala, the southernmost state of India, was commented across the world as a success story in managing the unprecedented pandemic(Chathukulam & Tharamangalam, 2021).National and international media, healthcare experts, policymakers and intellectuals focused onKerala for its effective management of the deadly virus (Biswas, 2020). Community reach out and advocacy programmes like *Corona Literacy Mission*, the state's Chief Minister's special slogan '*physical distance and social unity'*, a program for providing psychosocial support to the people in quarantine, isolation, school children and other categories of population were thought to have contributed to the pandemic management (Pal, Naik,Rathore, Sahu, & Kumar,2020).

Mass media content through daily press conferences of the State Government of Kerala (GoK) during the prevalence of Covid-19 pandemic in 2020 and 2021 was a unique initiative of Kerala Government. It involved the chief political executive and other key functionaries of GoK responsible for controlling the epidemic, communicating every 24 hours during the most intense phases of thepandemic. It was a unique case of a provincial government explaining and defending its actions and communicating directly with the citizens soliciting their active partaking in the resistance to the epidemic in real-time. In stark contrast, only Health Ministers or still junior officials addressed media for the Union government/other state governments in the country.

Covid-19 controlinvolved a host of measures such as community kitchens, isolation centres, community clinics, Covid control and social distancing, free ration kits, Vaccination units, enhancing ICU beds, medicine /oxygen supply etc. As a pressing concern in public policy and government activity involving almost all the executive agencies, effectiveness of government

action against Covid-19 was factored in the voting choices during 2021-22 across a range of contexts in India and abroad, generally favouring incumbent political actors.The effectiveness was amplified by a robust pillar of public communication using mass and social media platforms.

The exhaustive content of government press conferences treated in a very simple, lucid and ready to absorb style, in native Malayalam language, had a salutary impact in disseminating the Government's efforts aimed at controlling the infection and showcasing its achievements in managing the pandemic. The press conferences were highly designed deliberate media products prepared by analysts and media persons drawn from various scientific disciplines such as disease control, epidemiology, statistics along with expert content writers, collating inputs from various government departments, from non-resident Keralite professionals and senior government functionaries including experienced government media advisors who edited the massive daily inputs finally telecast for a duration of about 40 minutes to and one hour. The general elections were scheduled for April, 2021 when the incumbent Government from 2016 was to seek the mandate for a follow-on consecutive term. The press conference content was suggested in grey literature and public media to have had a favourable impact on the voter's attitude towards the coalition in power, favourably affecting voter predisposition in the general elections to theLegislative Assembly, increasing the vote share of the coalition in power, the Left Democratic Front (LDF) (from 43.48% in 2016 to 45.43% in 2021) and seats held by it in the legislature (from 91 seats in 2016 to 99 seats in 2021 out of total of 140).

With this background, the GoK's communication choice to address the citizens directly and extensively through 118 detailed daily televised press conferences were selected and content analysed for the study. It was hypothesised that the determinative control on the design of the mass and social media content has been exercised by the intensity of infection measured in terms of effective reproduction number or intensity of spread and the relative proximity of the dissemination to the elections to the State Legislative Assembly (SLA).

2. Materials and methods

118authentic digital video graphs of live press conferences conducted from 10th March 2020 to 29thOctober, 2020 were collected from the Department of Public Relations, GoK, and the contents categorized into various well-demarcated thematic areas. The video content was broadcast by the state television news channels in live mode and also live-streamed through social networking sites like YouTube, Twitter and Face book accounts of the Government and the Chief Minister. They attracted good post facto viewership also. Most video graphs show only the Chief Minister articulating the content and answering questions from attendant reports eventhough he is accompanied by Health Minister, Disaster Management Minister and the Chief Secretary to the Government. The videos were reviewedbatch-wise by experienced television viewersguided by an advisory along with an analysis of the scripts made for them.

An exploratory quantitative analysis was conducted on 118 authentic digital video graphs, totalling 73 hours(average daily episodic duration of 37.06 minutes), to investigate the variability in design and content concerning two independent variables: the effective reproduction number (R_t) as a

measure of disease spread severity, and the proximity to thenext general election. The R_t is operationally defined as the number of persons in a population who can be infected by an individual at any specific time. There will be an observed change in R_t in the population when the individuals get vaccinated or gain immunity following the infection. Other factors affecting R_t include the number of people with the infection; the number of susceptible people with whom infected people are in contact, and relevant human behaviour such as social distancing (Achaiah, Subbarajasetty, & Shetty, 2020). Thus, R_t is a robust measure which reflects the effectiveness of all interventions and control measures, hence it is selected as an independent variable to analyze the various content components that we have considered in the present study.

For this study, R_t is estimated based on sliding weekly windows, with a parametric serial interval using EpiEstim package in R software (Cori, Ferguson, Fraser, & Cauchemez,2013). Here, serial interval is defined as the time from onset of illness in the primary case to illness onset in the secondary case. This data was collected from few government public health centres. Mean of serial interval was found to be 4.7 days with standard deviation 2.9 days. The mean and standard deviation is used in R_t estimation while data on mortality and active cases were collected from Covid-19 dashboard of the GoK (2023)

In the next step, the dataset was divided into two phases: Phase A (March 2020 - June 2020) representing the initial epidemiologically oriented phase of Covid-19, and Phase B (July 2020 - October 2020) characterized as a more strategically/politically oriented phase due to the nearing SLA election (held finally on April 6th, 2021).Thirteen thematic categories were pre-identified, and the time allocation for each category was recorded for further quantitative analysis. The dominant category was found to be *miscellaneous (M)*, which accounted for a significant proportion of the overall time invested. To gain deeper insights into this content type, a sample of 20 video graphs with an average duration of 48.62 minutes was selected based on their contribution to the *miscellaneou*s content (25%) and subjected to further analysis.

Factor analysis was employed to determine the variability explained by the proposed dependent variables. Pearson's correlation and time lagged cross-correlation analysis (Walker, & Sulyok, 2008). were used to investigate the influence of the dependent variable in the preceding period on content design (Sato, 2003).Thus the methodology was designed in a novel way to gain scientific understanding of communication strategies during the Covid-19 pandemic, specifically analyzing the design and content of press conferences in relation to disease spread severity and electoral proximity.

Statistical analysis was performed using grapesAgri1, version 1.1.0 in R version 4.2.3 (Gopinath, Parsad,Joseph, &Adarsh, 2021).

3. Results and Discussion

The 13 thematic categories were determined through sample previews and trial analysis of the videos (Figure 1 (A) &(B)). The content(rounded to nearest minute) devoted to 13 predetermined thematic categories provide insights into the dependency of the content design on controlling independent variables *i.e.,* the prevalent intensity of covid-19 pandemic measured in terms of

$R_t$and the number of days remaining as on the dateof the press conference tothe SLA elections in April, 2021. The scripts relied to conduct the press conference was also sourced and used to confirm the content categories.

Figure 1 (A) & (B), below shows the distribution of duration of the press meet from 118 video graphs examined in phase A (epidemiologically oriented phase of Covid-19) and phase B (strategically/politically oriented phase) categorizedwith 13 pre-identified thematic categorizations.This was cross checked with the text of the content, compared and confirmed.

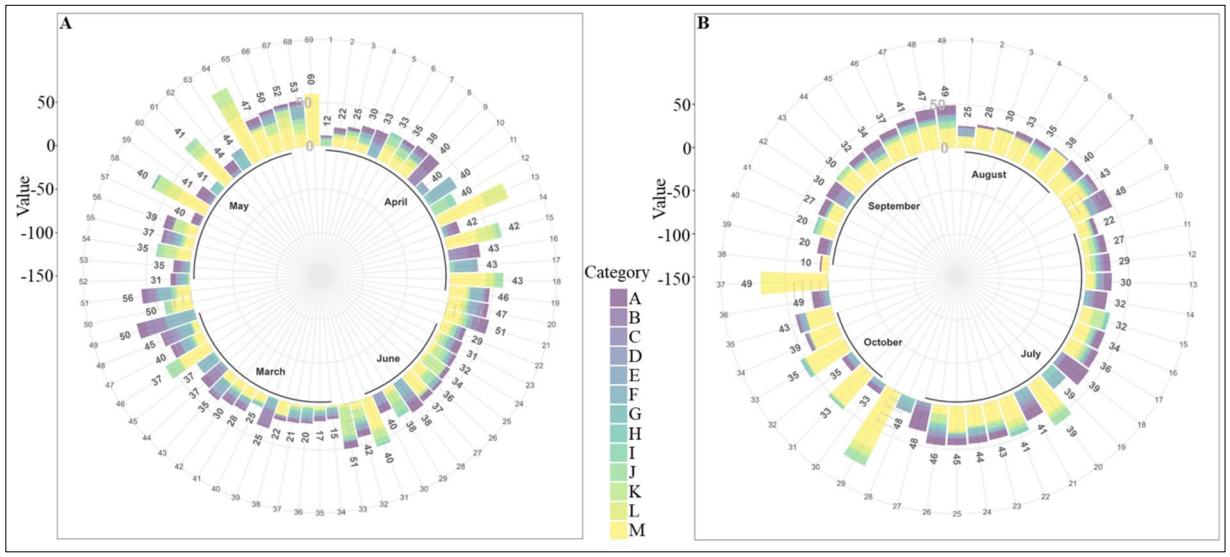

Figure 1 (A) &(B). Circular stacked bar chart showing the duration of press meet during Phase A: March 2020 to June 2020 & Phase B: July 2020 to October 2020.The values above the bars shows the total duration of press meet. Each colour indicates pre-identified variables.

The 13 pre-identified thematic categories were coded for analysis as follows. A –Covid Data, B – Covid Control measures, C– Public Distribution System, D – Educational & Social issues, E – Publication Festivals/Wedding, F – Precautions/Advisories to general public, G – Isolation, H – Covid Testing, I – Financial Assistance, J – Lock down, K – Non-residents issues and Guest labour related, L – Chief Minister's Relief Fund, M –Miscellaneous. The themes dealt in the press conference reflect the Government's priorities, concerns and mitigation activities during that period. Moreover, it reflects the diversity and intensity of the treatment offered to the content of the communication as the serial press conferences progressed during Covid-19 times. During Phase B, in the month of October, the time spent on *miscellaneous* category is higher compared to other months.

Based on the trend in the time spent on each thematic category, a further in-depth analysis over the last eight month period (March- October 2022) has been done (Figure2). There is considerable variation in the time allotted to each topic and the time allotted to *miscellaneous*is seen increasing towards October 2022. It reveals largely non-core and extraneous themes than more directly Covid-19 related topics as the press conference became more proximate to the general elections.

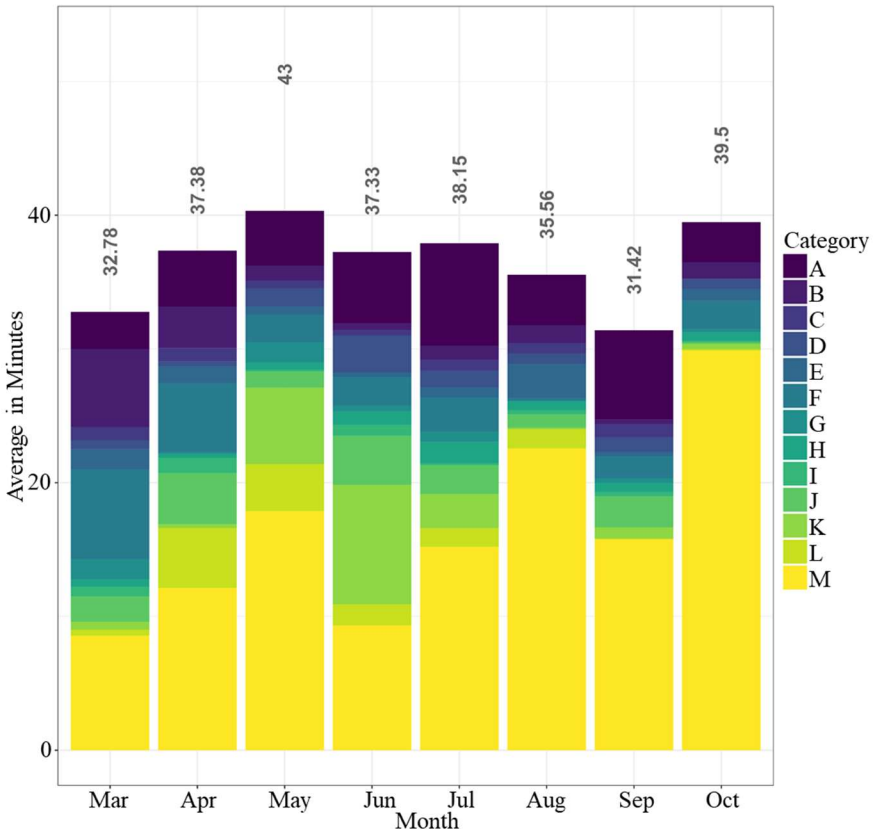

Figure 2.Average duration of the press conference along with time allotted for components from March 2022 to October 2022. The values above the bar indicate average duration during that month.

The time spent on miscellaneous was 40.65 % of the total hours of press conference followed by Covid data received in the previous 24 hours (12.29%), then5.56% to the Covid control measures adopted/advisedand 8.75% toaddressing/help enforcing precautions to general public. Least time is devoted for financial assistance to the affected people (1.37%).

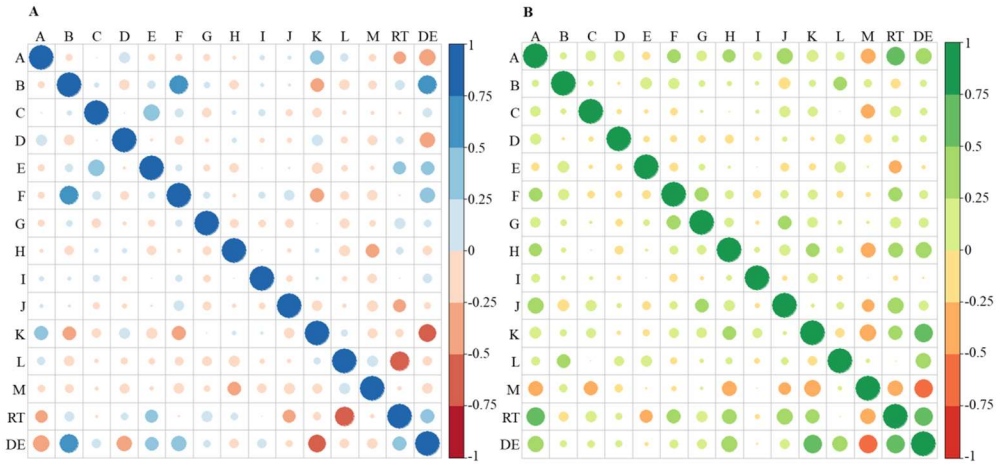

Figure 3 (A) & (B). Correlogram depicting correlation between time allotted for components during Phase A: March 2020 to June 2020 & Phase B: July 2020 to October 2020

A correlation analysis on pre-identified variables (Figure 3 (A) & (B)) during phase A reveals the time devoted for *covid data (A)* and *non-residents and guest labour related*(K) is positively correlated while both are negatively correlated with the days to the remaining election. Further, *covid control measures* (B) and topic on precautions to *general public* (F) is positively correlated. Both B and Fare highly positively correlated (positive) with the remaining days to election, indicative as the variable moves closer to phase B the time devoted on these topics were decreasing.

Educational & social issues (D) were discussed much towards the end of the phase and show a negative correlation with the days left for the election. A spurious correlation is seen between *Covid testing* (H) and M*iscellaneous* (M), a detailed analysis of pre-identified but highly internally variable *Miscellaneous* category will give more clarity on this.

Correlation analysis in phase B revealed that theR_t and days to election is positively correlated means as days to election decreased the R_t was decreasing. *Miscellaneous* (M) which was not of considerably important in phase A now shows a negative correlation with R_t and days to election, which shows that as the days to election decreases Covid-19 content decreases and miscellaneousthematic content is seen increasing. Another intervention was C*ovid-19 testing and* 57.3% of total content time was devoted on covid testing (H). A positive correlation of Covid testing with non-resident citizens' issues and migrant-labour related issues (K) indicated that the government has strengthened the Covid-19 testing for non-residents arriving in the state during this phase. Thiswas another focus of GoK activity to minimize the infection spread from non-residents returning in large numbers which was not strong in Phase A. These results conclude that percentage of time devoted to *miscellaneous (M), covid testing (H) and covid data (A)* has increased in phase B, as in Figure 4.

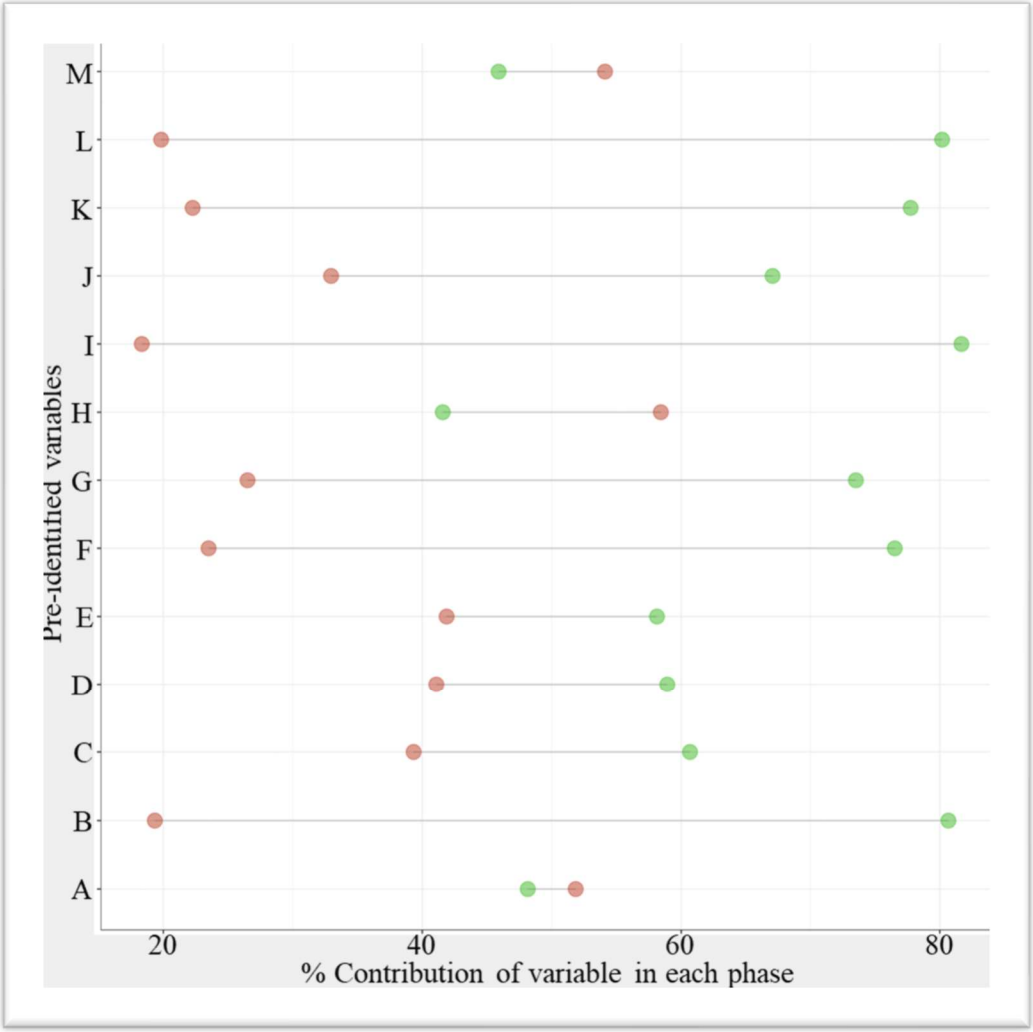

Figure 4. Percentage contribution of each variable in Phase A and Phase B.Here green circle is Phase A and red circle is Phase B

On performing a factor analysis with oblique promax rotation revealed that there were 2 underlying factors(χ^2= 47.08, df =53, p.val=0.73; indicates that model is an appropriate fit). The first 2 factors explained 21% of the variance in the data, though the variance explained is low, this can be attributed to the nature of the data used for the analysis.Figure 5 shows that number of identified factors from the data set is two (2).

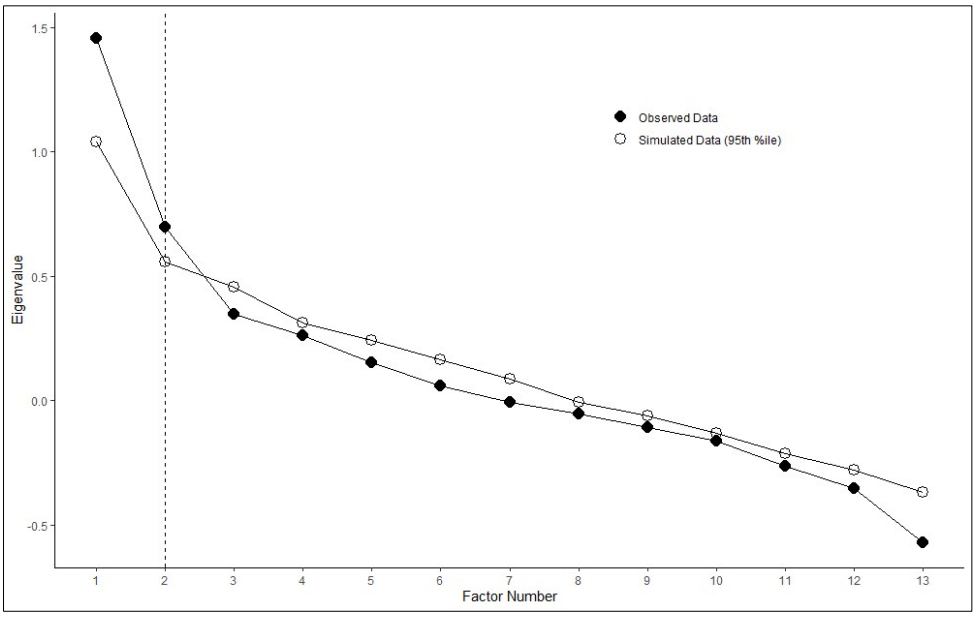

Figure 5.Parallel plot showing the number of factors identified to be two.

The loading of four variables shown inFigure6 below on the identified factors came to be of particular interest, while other variables have negligible contributions. *Covid control* measures andprecautions to general publichave high positive loading on factor 1 on the other hand, content involving non-resident Keralites and guest labour related has a negative loading on the factor 1. *Miscellaneous* contents were having a high negative loading on factor 2.

Communality represents the percentage of variance in the variable that is explained by all the factors and as the variance explained in the non-resident content is low, it may be considered as the remaining three variables to comprehend the underlying factors (Table 1).

Table 1: Communality and Uniqueness of the variables

Variable	**Communality**	**Uniqueness**
Covid control measures	0.606	0.394
Precautions to general public	0.561	0.439
NRI guest labour related	0.182	0.818
Miscellaneous	0.995	0.005

Based on the variables *Covid control*, *precautions to be taken by population* and its influence on the factor 1, factor 1 is identified as related to Covid-19 spread. Factor 2 can be identified as the days remaining to thegeneral election, because when it is decreasing a high negative loading indicates an increase in *miscellaneou*s (non-covid 19) content. Further indepth analysis of the exact determiners of the content classified as *miscellaneous*is required to confirm these initial findings. Factor analysis confirmed that content was highly influenced by two factors like R_t and the proximity to elections.

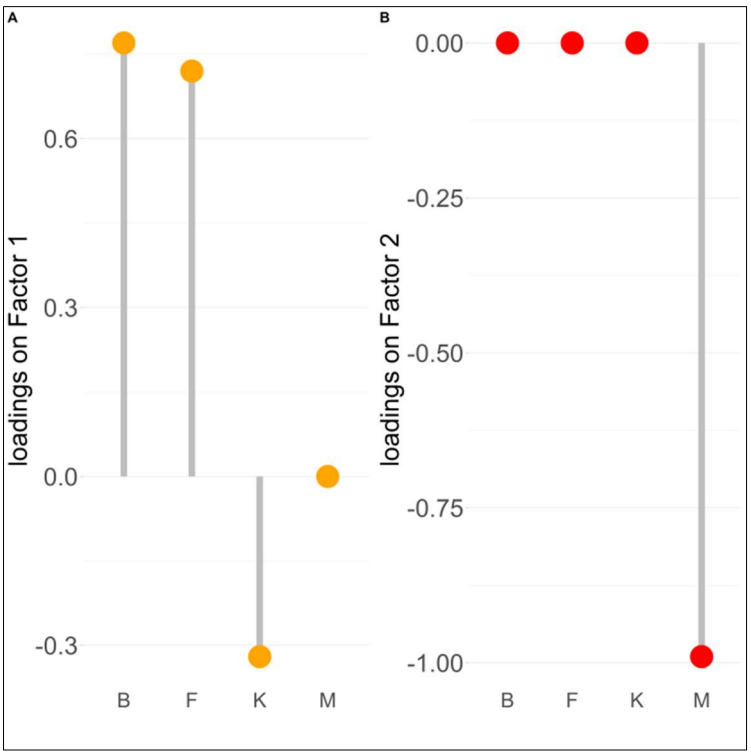

Figure6. Loadings of each variable on factors

Seven day moving averages of daily data on duration of press meet and Rt were calculated as it separates out random variations. Visualizing moving average enables to identify any trends on comparing both time series data. The seven day moving average of Duration and Rt values are given below (Figure 7).In this study X_t is the seven days moving average of the duration of press meet in hours and Y_t is the 7 day sliding window values of estimated R_t value, which is an indicator of the spread of Covid-19.

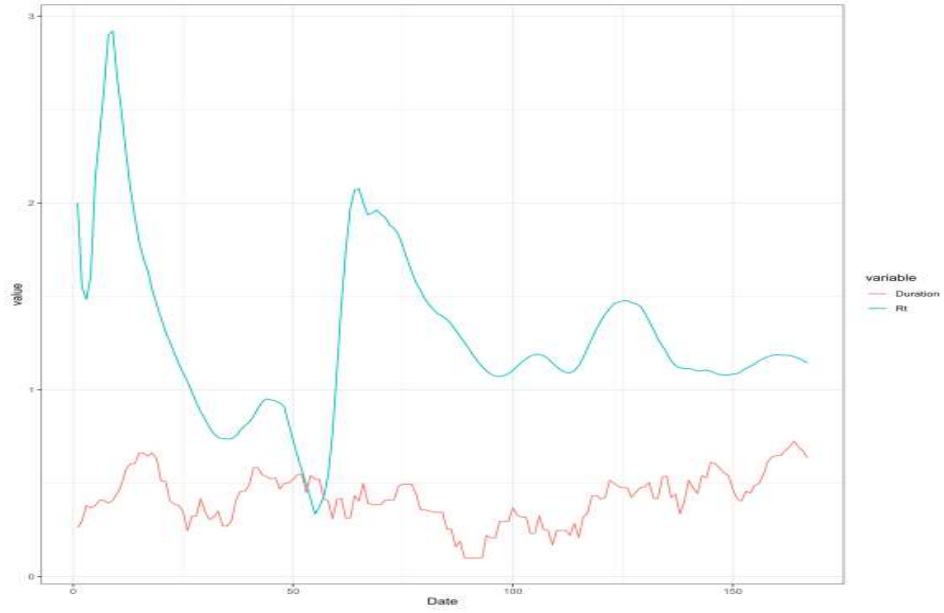

Figure 7. Seven days moving average plot of R_t and press meet duration (in hours)

Result of time lagged cross correlation between seven days moving average of duration of press meet in minutes (X_t, Dickey-Fuller = -3.6957, Lag order =5, p-value = 0.04463) and Rt (Y_t, Dickey-Fuller = -3.8724, Lag order =4, p-value = 0.01786)are shown in cross correlation plot (Figure 8).

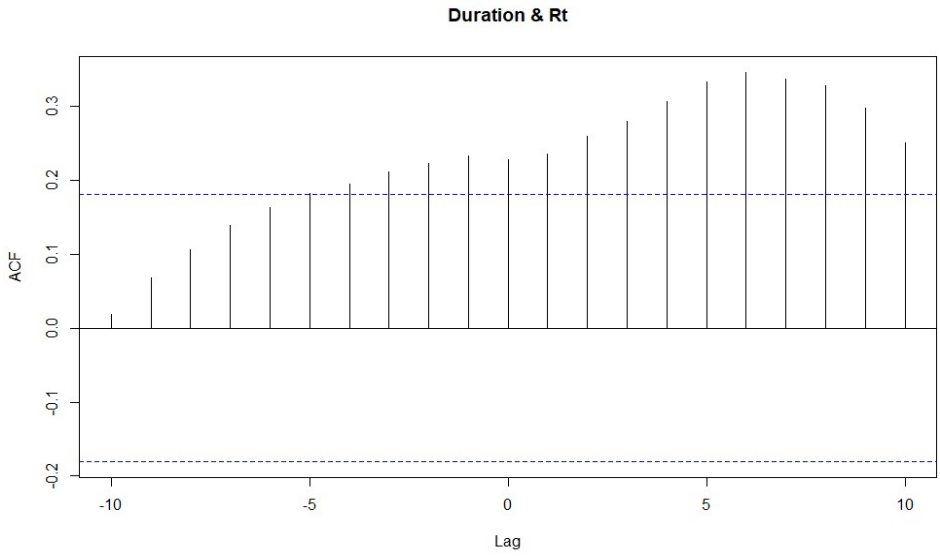

Figure 8. Cross correlation plot between seven days moving average of duration of press meet (in minutes) and R_t.

There is a non-zero cross correlation in the lag 0 to 10. This is an indicative that the spread of the disease in the previous days hasdefinitely influenced the duration of the press meet. Since the population is considered for the study, the non zero correlation of above 0.30 can be considered significant. It can be seen that X_t(duration)is the leading variable, as there is no prediction

component as the event has already occurred, it can be concluded that there is a definite correlation between variables in the lag 0 to 7. Maximum cross correlation of 0.33 is observed in the lag 5. It can be interpreted that, the increased disease spread rate over a particular week has primarily influenced the duration of the press conference throughout that week. The investment on the content was highly informed largely by the prevalent (Rt).

Therefore, the content design of the press conference was largelydrivenby the average prevalence rate of infection for the previous seven days and indicates that the press conference was designed and driven by subject experts. So, aconclusion can be dawn that the thematically differentiated content of the GoKCovid-19 press conferences were predominantly driven by the rate of infection prevalent a week ahead of the communication which indicates that the format was shaped in sufficient fidelity to the need for communicating that theme at that point of time. The content and design show influence by the vector for the disease prevalence throughout. It shows the exercise wasindeed demand driven and focussed on the disease spread. Functionalist theory has driven the design principles of the press conferences and the need to control infection hasprimarily informed the content of GoK public communications.

The two of the pre-defined content Covid-19 control measures and precautions to general public, which came out to be the variables contributing in the factor analysis were also subjected to cross correlation analysis. Seven day moving average of time devoted to Covid control measures (X_t, Dickey-Fuller = -4.0245, Lag order =4, p-value = 0.01048) and seven day moving average of precautions to general public(X_t, Dickey-Fuller = -4.7382, Lag order =4, p-value = 0.01) were taken against 7 days sliding window estimates of Rt(Y_t) values (Figure 9 & 10)

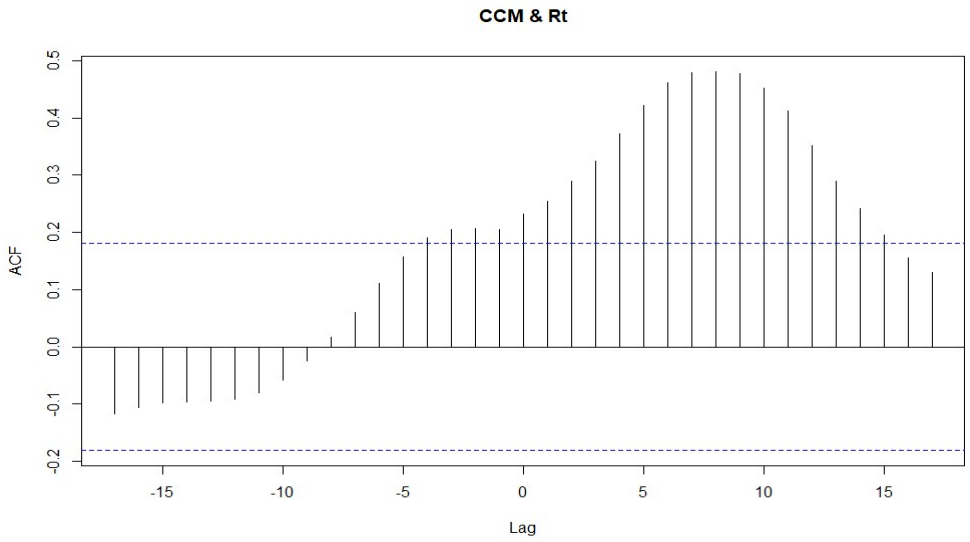

Figure 9. Cross correlation plot between seven days moving average of Covid control measures and Rt

The results of cross correlations between Covid-19 control measures as well as precautions to general public and $R_t$showed, as expected, a high correlation close to 0.5 towards lags 4 to 10.

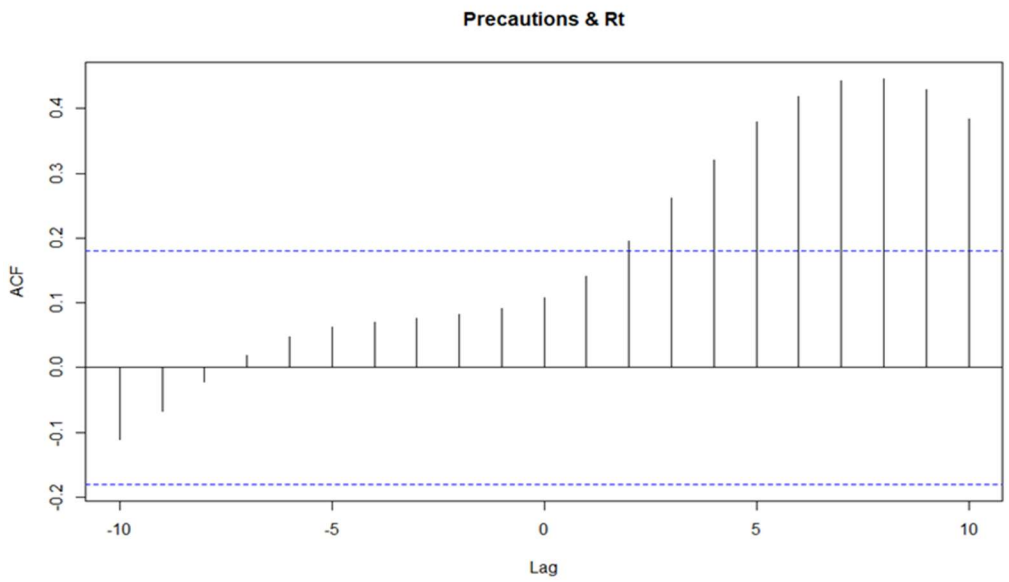

Figure 10. Cross correlation plot between seven days moving average of precautions advised to the general public and Rt

These results again confirm the logic behind the design of the content of the press conference, as the prevalent rate of infection increases the more time is devoted to Covid-19 control measures and precautions relatively against the other contents of the press conference. The prevalence of infection and need for control measures primarily drove the variability of the content design.

Out of the 118 video graphs analyzed, it was found that *miscellaneous* content dominated the dataset. Therefore, a sample of 20 video graphs, average duration of 48.62 minutes, was further identified based on the high *miscellaneous* content (25%) and analyzed to gain deeper insights into the content type. This miscellaneous content was further classified in to few relevant categories it is important to note that some of the identified categories had only a small amount of content i.e less than 5 minutes, across the entire set of 20 video graphs. Hence, including these categories in the analysis may potentially distort the overall findings of the study. Therefore, to ensure the integrity and validity of the analysis, these categories which contributed to a total of 42.12 minutes only were excluded, finally a new 13 set of categories were identified with in miscellaneouswhich contributed to 5.31 hours of the total *miscellaneous* content.

The sample data set consisted of 20 randomly selected data points, consisting of video graphs recorded between 6th May, 2020 and 26th April, 2020. A total of 16.21 hours (972.4 minutes) of video graphs were analyzed, out of which 6.01 hours (360.72 minutes) were identified as *miscellaneous* content. This represents approximately 37.07% of the total content analyzed. A critical analysis of the *miscellaneous* content again revealed 13 distinct categories, which are listed below.

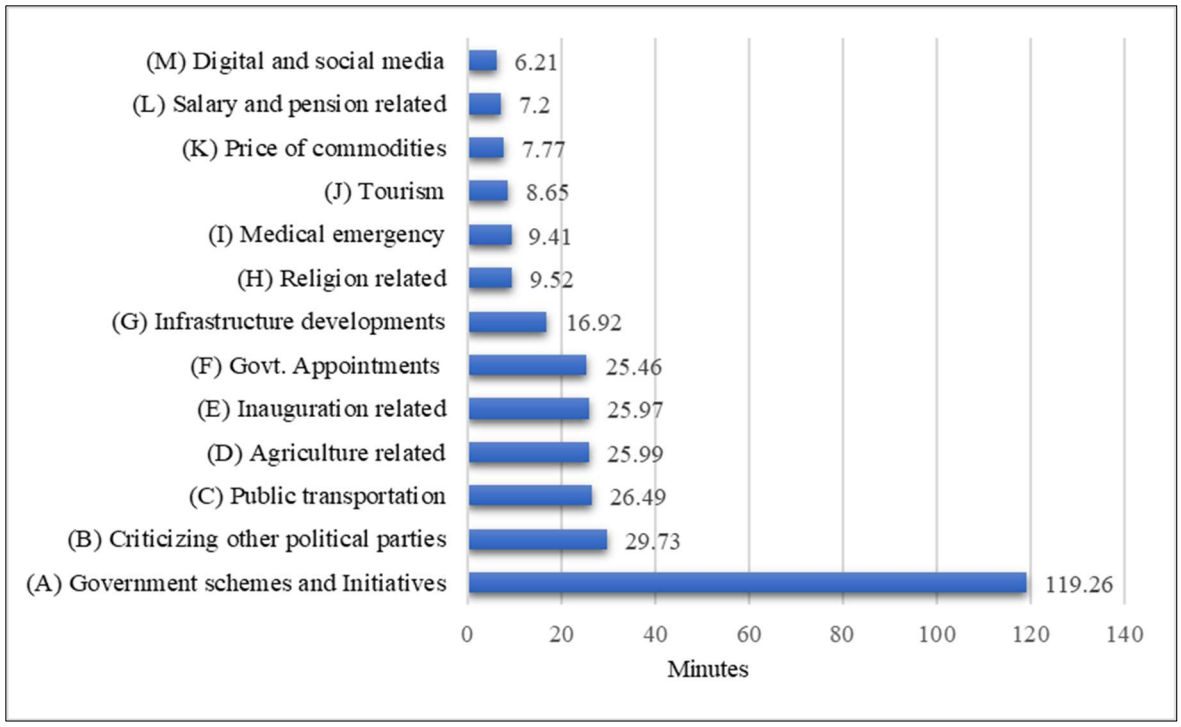

Figure 11. Content categories under the miscellaneous theme of the GoK press conference during Covid-19.

It was evident that the category of *government schemes and initiatives* contributed highly to the *miscellaneous* content, accounting for a total of 119.26 minutes (almost 2 hours) across the 20 video graphs. This category included discussions on various government schemes such as the 100 Day Action Plan, 'Life' Mission Program (pro poor housing project), Kerala State Road Transport Corporation Restructuring project 2.0, Kerala Suchitha Mission, Integrated Urban Regeneration and Water Transport System, and K-Fone (government interact project).

The analysis revealed that some categories of *miscellaneous* content covered a major share of the total time of the video graphs under investigation. A critical examination and explanation of these categories using the ridge plot (Figure 12) depicts the distribution of *miscellaneous* categories over time, i.e., from 6thMay, 2020 to 26thApril, 2020. The *government schemes and initiatives* (A) and *criticism of other political parties* (B) categories were the most frequently discussed topics, with a significant investment of allotted time. In addition, the results revealed that the *public transportation* (C) and *agriculture related* (D) categories were discussed but were not further explored in the analyzed videographs.

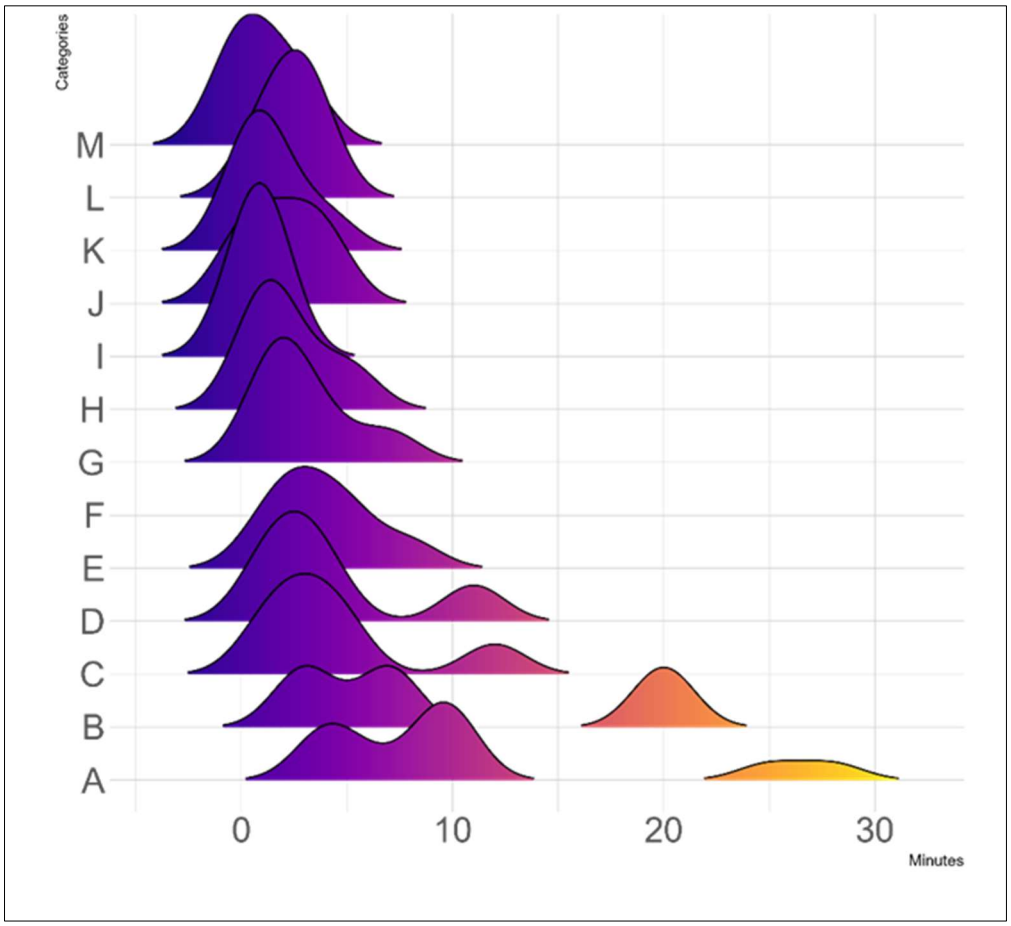

Figure 12. Distribution of *miscellaneous* categories over time in telecasted press conference videographs from 6th May, 2020 to 26th April, 2020.

The discussion on *government schemes and initiatives* increased significantly as the elections approached and the *100 Day Action Plan* was the topic significantly discussed under this category, with a total of 43.2 minutes dedicated on focusing the flagship program of the government that aimed to mitigate the sufferings faced by individualsdue to the Covid-19 pandemic (Figure 13).

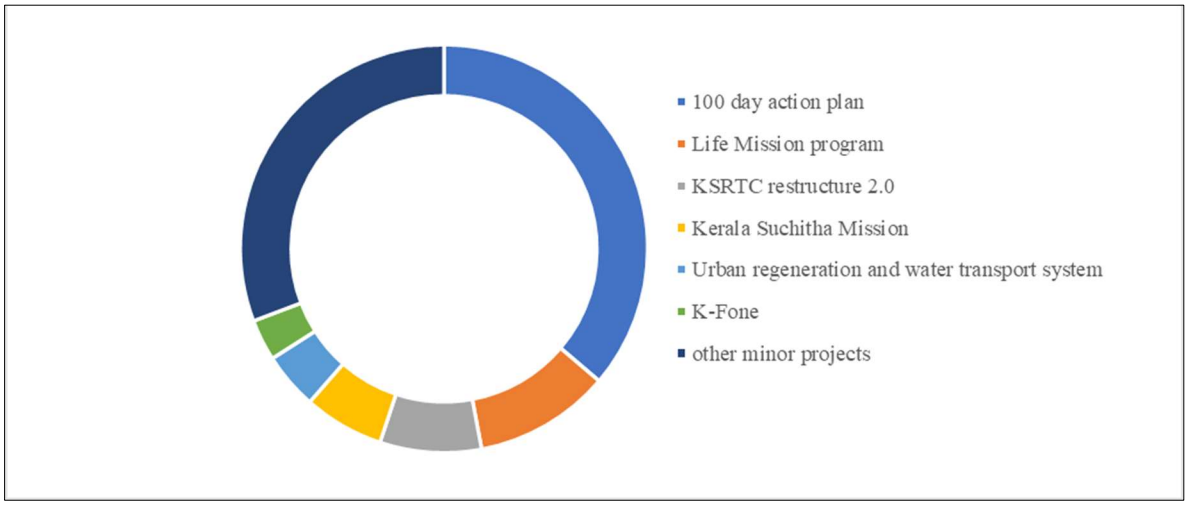

Figure 13. Government schemes and programmes discussed under *miscellaneous* category of press conference content

Secondly the category *criticism of other political parties* accounted for a total of 29.73 minutes across the 20 video graphs. Although the time spent was shorter compared to the time spent on *government schemes and initiatives*, it is interesting to note that as the election period approached, the amount of time spent on content category *criticizing other political parties*peaked (Figure 12). In other words the Covid -19 public press conferences were highly influenced by the Covid-19 spread date and scientific control measures in the former phase and these gradually shifted to considerations seeking rewards from the political economy in latter/ last phases. Science and political economy drivers primarily underpinned the communication effort.

4. Conclusion

This research paper examined the communication strategies employed by the government of Kerala, India, during the COVID-19 pandemic. Through approximately 200 daily press conferences led by the chief political executive and broadcast live across multiple media platforms, the government aimed to effectively control the infection rate and mortality. Using a quantitative analysis of 118 authentic digital video graphs, the study explores the variability in design and content based on two variables: the effective reproduction number (Rt) and the proximity to the next general elections. The findings reveal that the content of the video graphs is strongly influenced by the severity of disease spread (Rt) and the approaching elections. The government successfully maintained a balance between political content and COVID-19 related topics, with asteady increase in discussions about government schemes and initiatives as the election period approached. The media excercise thus answered both Science and political economy driven goals leading to a repeat mandate. The widely acknowledged agenda setting impact of the press conference videographsis hypothesised to have contributed to this success of Science acting in the political economy. This research paper presents a unique approach to content analysis, providing valuable insights into government communication strategies during the pandemic. The findings contribute to a better understanding of the interplay between disease spread severity, essential political economy considerations, and effective crisis communication that needs to balance underlying science and political economy compulsions for 360^0 success**.**

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Conflict of interest

The first author is a government servant, however no conflict of interest exists to the content as he is in a different department. No other author has any conflict as well.

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